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THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS



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L. B. KRUEGER

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The public utility system of **Standard Gas and Electric Company**

includes

The California Oregon Power Company
Duquesne Light Company (Pittsburgh)
Equitable Gas Company (Pittsburgh)
Kentucky West Virginia Gas Company
Louisville Gas and Electric Company
Market St. Railway Company (San Francisco)
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THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS

RICHARD T. ELY, *Editor-in-Chief*

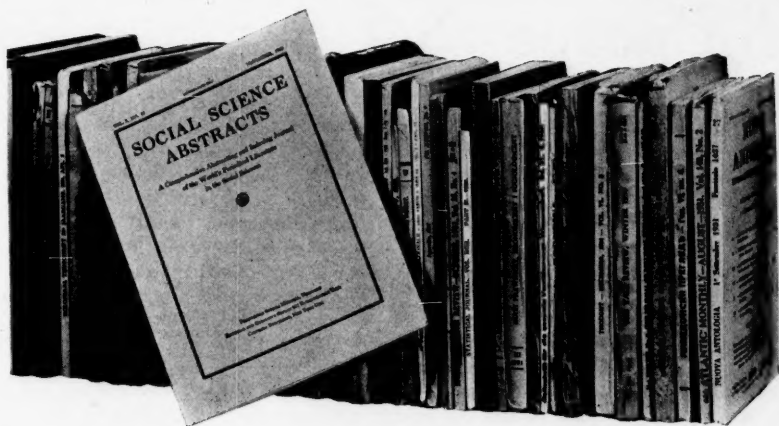
E. W. MOREHOUSE, *Managing Editor*

HELEN C. MONCHOW, *Assistant Editor* DORA W. THEOBALD, *Business Manager*

The contributors to this number include:

- L. B. Krueger**, Member of the Staff of the Wisconsin Tax Commission, supervising the work of assessors of income and supervisors of assessment in connection with property taxation.
- Virgil P. Lee**, Professor of Marketing and Finance, Agricultural and Mechanical College of Texas, College Station, Texas.
- Martin G. Glaeser**, Professor of Economics, University of Wisconsin.
- Herbert S. Swan**, City Planning Consultant, New York City.
- Walter E. Caine**, formerly Special Investigator on a Power Survey in Wisconsin; Scholar in Public Utilities in the Institute, 1930-31.
- Rosalind Tough**, formerly Instructor in Economics, Hunter College, New York City.
- Kenneth Field**, Associate Professor of Economics, School of Business Administration, University of Colorado, Boulder, Colorado.
- Lewis A. Maverick**, Lecturer in Economics, University of California at Los Angeles.
- Clyde Olin Fisher**, Professor of Economics, Wesleyan University, Middletown, Connecticut.
- Myles E. Robinson**, Associate Professor of Commerce and Finance, James Millikin University, Decatur, Illinois.
- David E. Lilienthal**, Member, Public Service Commission of Wisconsin.
- Horace M. Gray**, Assistant Professor of Economics, University of Illinois.
- Charles S. Ascher**, Assistant Director, Public Administration Clearing House, Chicago, Illinois.
- Grace M. Jaffé**, Research Assistant to Dr. Richard T. Ely.
- William M. Duffus**, Professor of Business Organization, College of Commerce and Administration, Ohio State University.
- Charles H. Porter**, Professor of Accounting, Department of Business and Engineering Administration, Massachusetts Institute of Technology.
- H. Zinder**, Special Public Utility Investigator, Public Service Commission of Wisconsin.

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THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS

MAY
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NUMBER 2



The Classification of Farm Lands for Assessment Purposes in Wisconsin

By L. B. KRUEGER*

DURING the past two decades marked progress has been made in the appraisal of urban real estate for purposes of taxation. The intensive studies of Somers, King, Zangerle, and others have resulted in placing at the disposal of the city assessor valuable data on the basis of which it is possible to make reasonable deductions and comparisons. The average city assessor is frequently found to be equipped with adequate files, standard front-foot values, tables measuring depth and alley influences, cost data, information pertaining to rentals, considerations, leases, consolidations, and encumbrances. This information facilitates the establishment of equitable comparative values or assessments, a

fundamental requisite in a fair distribution of the cost of government.

Despite progress made in the appraisal of urban real estate, comparatively little of a constructive nature has been done to aid the rural assessor in his work. This may result in part from the difficulties of appraising rural real estate. It is generally felt that elements contributing to the value of farm real estate, such as nature of top-soil and sub-soil, topography, drainage, area available for profitable use, distance to market, tilth of soil, and home factors affecting value, are not susceptible of definite measurement. Since value elements of farm real estate are not the same and similar elements have not the same values in different sections of the average

**Editorial Note:* A brief statement concerning the Wisconsin system of assessments will supply a useful background for this article. In Wisconsin a supervisory administrative organization has been interposed between the Tax Commission and the local assessors. These employees were originally the assessors of income serving in the dual capacity of assessing individual incomes and supervising the local assessors. Since the

income tax was adopted in 1911, the trend has been toward consolidation of assessor-of-incomes' districts into larger units and toward specialization of function, some men giving full time to income tax work, while others devote their entire time to property taxation. Where supervisors of assessments are referred to in this article the author refers to assessors of incomes or their deputies engaged in property tax work.

state or even of the same taxation district, it has hitherto been considered quite impossible and impracticable to attempt to reduce elements of value in farm real estate to measurable terms.

The Department of Agriculture at Washington and the Experiment Station of Minnesota have attempted to measure mathematically the soil factor in terms of physical output per acre by means of multiple curvilinear correlation.¹ In Minnesota a productivity index was figured on the basis of the average yields of the principal crops grown in Blue Earth County. The Federal Department of Agriculture in an investigation in Indiana attempted to show the relationship of farm value to soil fertility in terms of acre yield in bushels in corn.

These studies were in the nature of experiments and should be so considered. The Minnesota study was based on sales for the years 1916-1919 and the results obtained in a given community at a given time might not be applicable to another period, such as one characterized by falling farm real estate values, nor to another community where conditions are more likely to be dissimilar than similar. To establish arbitrary differentials for distance to market or nature and condition of highways by mathematical means has greater possibilities and more will be said on this point at another place. But under present conditions the attempt to measure physical productivity by multiple curvilinear correlation is impracticable. This method is highly technical and since conditions between taxation districts differ widely, a productivity index would have to be computed for communities

having varying conditions. It would be the height of folly to expect the average assessor to work out his own physical productivity index. This would necessitate a technical staff associated with the state tax commission which would entail an expense quite out of proportion to the results achieved.

Likewise impracticable under American conditions is the use of farm incomes or rentals in arriving at the capital value of a farm. The difficulties of allocating the part of the income attributable to the efficiency of the farm as a production plant and the part attributable to superior managerial ability, together with the difficulties of capitalizing either present or prospective incomes, make the plan unworkable under present conditions.²

Vertical Classification of Farm Real Estate

Wisconsin has attempted to reduce these seemingly incommensurable elements to measurable terms by a comprehensive classification of farm real estate. A beginning was made in that direction as early as 1901 when a law was passed requiring assessors to appraise separately land and improvements and to place the value of lands and improvements in separate columns in the roll.³ The primary object of the law was to improve the character and quality of local assessment in cities. To require assessors to place separate values on land and improvements is a basic requisite to an equitable assessment. From the standpoint of equitableness, separation in the case of rural property is quite as essential for towns and counties as it is for cities. If all taxpayers in a taxation district were farmers, if all had farms of about

¹ Hass, G. C., "Sales Prices as a Basis for Farm Land Appraisals," *Minnesota Agricultural Experimental Station Test Bulletin*, No. 9, November, 1922.

² On this point see an article by Black, J. D., and

Black, A. G., "The Principles Involved in Farm-Land Appraisal for Loan Purposes," 2 *Journal of Land & Public Utility Economics* 396-407 (October, 1926).

³ Laws of 1901, c. 92.

the same size, if all farms had improvements about equal from the standpoint of both utility and aesthetic value, separation between land and improvements would be quite immaterial for taxation purposes. Assessments at the statutory standard of full value or at the same percentage of full value under these conditions would result in a fair distribution of the costs of government. But property within the more distinctly rural taxation districts is fast losing its homogeneous character. Farms are not equal in size. Some are equipped for dairy farming and some for grain farming; some descriptions have no buildings whatsoever. Furthermore, some townships not uncommonly contain several non-incorporated villages, a score or two of road houses, filling stations, and mercantile establishments. Under these conditions, unless the assessor separates value of land and value of buildings and assesses each at the same percentage of full value, the tax burden will be misplaced. In the case of a full-value assessment for a taxation district as a whole, if the overassessment on the land offsets the underassessment on improvements, and if the assessor applies the same standard to residential and mercantile property that he applies to farm improvements, as the statutes require him to do, part of the tax burden will be shifted from the residential and mercantile property owners to the farm element in the taxation district.

In less developed townships, the inequitableness of such a policy presents itself in another way. Let us take a township half of which consists of well-developed farms, owned by farmers who have passed well beyond the pioneer stage. Improvements on these farms are adequate to meet the needs of the farms. The other half of the township is less developed, consisting of cut-over

lands, timber lands and 20 or 30 pioneer settlements whose owners are in the process of clearing the land and erecting homes. What happens in this town if the assessor overassesses the land and underassesses improvements? Invariably he will place a valuation, let us say, of \$1,200 on improvements worth \$4,800 and assess the shacks of the pioneer at \$600, when they are worth \$800.

Any tendency toward exempting farm improvements from taxation produces results exactly opposite to those which the adherents of Henry George have always proclaimed. The assessment of land at full value and the underassessment of improvements will place the burden on the shoulders of those in the district who are least able to bear that tax. The resulting higher rate will fall with greater weight on the pioneer who has not yet established himself on the soil. His farm, silo, fences have not been carried to the point where he can fully utilize the land. The high tax rate which is frequently the cause of tax delinquencies in the cut-over districts in northern Wisconsin is not always attributable to the fact that the taxation district is living beyond its income. All too often an inequitable assessment results in a misplacement of the tax burden. The underassessment of improvements fails to place the burden on the shoulders of those possessing the greater tax-paying ability.

These two illustrations should suffice to show that separation of land and improvements is quite as essential for the more distinctly rural taxation districts as it is for cities. Indeed, it is no exaggeration to say that equitableness in the assessment process cannot be attained unless a separate valuation is placed on land and improvements and unless each is assessed at full value or at the same percentage of its full value.

Reasons for Classification in 1925

The separation of the value of land and the value of improvements may be considered vertical classification according to type of property. Not until 1925 was any attempt made to classify property horizontally according to use. Since 1925 the assessment roll has required that real estate be classified into six groups, namely: A, residential; B, mercantile; C, manufacturing; D, agricultural; E, marsh, cut-over, and waste; and F, timber lands. The last three classes are further sub-classified as follows: agricultural, grades 1, 2, and 3, wild hay, and pasture; Class E, marsh cut-over good, cut-over poor, waste; timber, mixed timber, wood. This change in the roll resulted from a change in policy on the part of the Tax Commission rather than from legislative enactment. Not until 1931 was this classification written into the statutes.⁴ The law passed in 1931 merely gives legal recognition to what had already become an accomplished fact. Between 1925 and 1931 the local assessor in classifying real estate was merely carrying out the mandate of the Tax Commission; henceforth, he will violate his oath of office if he fails to do so.

The reasons for the change in policy in 1925 are several. In the first place, it was felt that a comprehensive classification of real estate according to use would improve the character and quality of the local assessment. In the second place, a change in the value trends of

various classes of real estate necessitated a fundamental change in the method which hitherto had been used by the Tax Commission in arriving at taxation district values.⁵ Finally, as a guide to future policies and intelligent decisions on the part of the Tax Commission, statistics showing both the relative and absolute amounts of residential, manufacturing, mercantile, and agricultural property in the State were needed.

Classification Illustrated

Necessary as classification was in order that the Tax Commission and its employees might pursue a more enlightened policy in building taxation district values, it was primarily advocated on the ground that it was essential to an equitable local assessment of farm real estate. As long as we have a property tax, comparison must continue to be the principal method of assessing farm real estate. Property sold must be compared with property which has not sold. To facilitate such comparison property sold must be broken up into separate and distinct elements which may be compared with property which has not sold.

While farms are purchased as entities, it is essential nevertheless that the assessor break up sales into distinct and separate elements so that he can impute values to farms which have not sold. How local assessors in Wisconsin analyze farm sales through the aid and cooperation of supervisors of assessment is illustrated below. This example involved a sale in 1930 of 160 acres of land

⁴ Laws of 1931, c. 427, S. 1, 2.

⁵ It is not the purpose of this paper to discuss the bearing which the classification of farm real estate has on the building of equitable taxation district values, commonly called equalization. Obviously, however, if a taxation district has six classes of property with residential, mercantile, and possibly manufacturing property rising in value, which was generally the case in Wisconsin between 1921 and 1929, with other classes of real estate (agricultural, cut-over, and timber lands)

receding in varying degrees, a composite, unclassified ratio applied to the local assessment cannot be used in equalizing taxation districts. If a ratio method is to be used at all it must be a classified ratio, a ratio applied separately to each class of property on the basis of sales for one year and to obtain a more adequate sample sales must be supplemented by appraisals. These were the conditions which led to the abandonment of the ratio and five-year average method of equalizing taxation districts in Wisconsin between 1921 and 1925.

in the town of Pleasant Valley, Eau Claire County. The total consideration was \$17,500 but the price included considerable personal property which was separately appraised at \$4,500, leaving \$13,000 as the net price paid for the real estate.

Before the appraiser can place a value on improvements he must note the lay of the land, its general quality, and location. The experienced appraiser notes immediately elements of sameness and dissimilarity between the farm in question and other farms the worth of which is known. He makes comparisons with other sales which are alike in everything but buildings and he also makes comparisons with other farms which are

alike in everything but land. Automatically, he says to himself, "This farm compares favorably with Henry Smith's farm, Richard Doe's farm, etc., which sold for so much per acre." Automatically also he makes a tentative separation of the valuation of land and improvements. The value placed upon improvements may later be revised after a detailed analysis of the land.

Returning now to a specific sale it is essential to classify the land into separate classes and sub-classes (Map I). The appraiser notes that one forty SW-SW Sec. 21 is composed of all first grade land. Another forty the NW-NW Sec. 28 is of the same quality but a bad gulch, an acre in extent, running through it on the north, he calls waste. The SE-SE Sec. 20 is not as good and 30 acres of this forty are placed in second grade and 10 acres in wild pasture. The other forty NE-NE Sec. 29 is less homogeneous in character and the appraiser must do some estimating to obtain the approximate areas of various classes and sub-classes. It will be noticed that each forty on Map I is divided into 16 squares, each square representing 2.5 acres. By walking over the land and noting the relative areas of various grades of land and coloring sections of his diagram as he goes along, the areas of each class or sub-grade may be determined with approximate accuracy. The classification process is illustrated on Map I and Table I gives the unit prices for the various grades.

To classify a farm accurately into classes and sub-classes constitutes one problem. To impute equitable unit prices to these various subdivisions is a separate and distinct problem.

How Classification Aids in Determining Unit Prices

There are two fundamental prerequisites to an equitable assessment

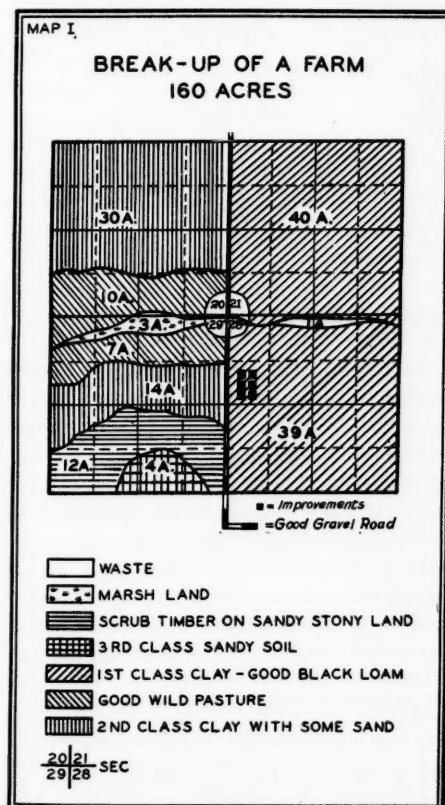


TABLE I. UNIT PRICES ON VARIOUS GRADES OF LAND.*

Sub-Classification	Number of Acres	Unit Prices	Totals
1st Grade.....	79	\$75	\$5,925
2nd Grade.....	44	55	2,420
3rd Grade.....	4	20	80
Wild pasture.....	17	25	425
Marsh pasture.....	3	10	30
Scrub timber.....	12	20	240
Waste.....	1	0	0
Value placed on bare land	160	.....	\$9,120
Value of buildings			3,880
Total value of farm			\$13,000

*The break-up of this sale was made by Walter Dick, Deputy Assessor of Incomes at Eau Claire. For years Mr. Dick was assessor of the Town of Madison. He made the appraisal only a few months after assuming his new duties. Evidently as a local town assessor he had been able to master the difficulties involved in the classification of farm real estate.

of real estate. One is correct classification; the other is the application of unit prices to the various classes and sub-grades which reflect normal market conditions. Of these prerequisites, unquestionably the first is the more important. If all property in a taxation district were properly classified, the unit prices applied to each class might be purely arbitrary and yet on a comparative basis the resultant values might be equitable. However, as far as it is humanly possible, values for assessment purposes must conform to market values. How Wisconsin supervisors of assessment break up sales for the purposes of establishing market trends and unit values is illustrated below. The following 12 sales were analyzed for 1931 by a supervisor of assessments⁶ in several towns where fairly homogeneous conditions prevail (Table II). In other words, only those sales were grouped together in which the physical characteristics of lands were approximately the same.

⁶ E. A. Cleasby, Assessor of Incomes in District No. 18. Mr. Cleasby with three deputies has supervision over 11 counties. These men spend a goodly portion of their time between assessment periods fielding (appraising) and analyzing sales, both rural and urban, to establish trends for various classes of real estate. During

Through a continuous analyzing and breaking up of sales the supervisor at the group meetings in April will be in position to recommend unit prices for various classes and sub-classes of property in those taxation districts where homogeneous conditions prevail.

TABLE II. BREAK-UP OF 12 SALES, 1931.

Classification of Sales	Number of Acres	Appraised Value per Acre	Total Value
<i>Appraised Value</i>			
<i>Class D</i>			
1st Grade.....	179	\$70.30	\$12,585
2nd Grade.....	310	38.58	11,960
3rd Grade.....	129	30.00	3,880
Wild hay.....	.....	.....	.....
Wild pasture.....	198	18.53	3,670
Totals.....	816	39.83	32,095
<i>Class E</i>			
Marsh.....	.....	.....	.....
Cut-over good.....	.....	.....	.....
Cut-over poor.....	118	3.68	435
Waste.....	24	.....	.....
Totals.....	142	3.68	435
<i>Timber F</i>			
Soft.....	.....	.....	.....
Hard.....	.....	.....	.....
Wood.....	125	19.00	2,355
Scrub.....	67	9.35	660
Totals.....	192	15.80	3,035
Grand Total.....	1,150	\$30.92	\$35,565
<i>Sales Price</i>			
Land.....	1,150	\$30.85*	\$35,480
Improvements.....	.....	.....	20,525
	1,150	\$48.75	\$56,005

*Note the closeness of the appraised value per acre (\$30.92) as compared with the average sales price per acre (\$30.85).

In this break-up of sales the careful reader will undoubtedly demand further information on one or two points. How is this split made between land and improvements? The total value of the land amounts to \$35,480 as compared to \$20,525 placed upon improvements. Obviously it is possible to arrive at either figure by a process of elimination, but is the value of building or the value of land the residual element? Under the assess-

the assessment season they spend their time supervising local assessors. The average town assessor would do a poor job of classifying rural real estate without supervision. Some do a poor job of it even with supervision, but great progress toward accurate classification has been made since 1925.

ment laws of Wisconsin and the great majority of states the value placed on improvements must be the value which those improvements add to the value of the bare land. Under the statutes and court decisions, regardless of cost, improvements are worth only the market value which they add to the bare land with which they are used. Our problem in America would be greatly simplified if we could do as Canada does, assess bare land at its cash value and improvements on a cost basis. Under the Wisconsin law and laws of most states the question must be answered, "What would the ordinary purchaser pay for these improvements in addition to the bare land?" If farm improvements adequately met the needs of every farm, sound value of improvements—i. e., cost of reproduction minus depreciation—could more easily be used for comparative purposes. But farms are overbuilt and farms are underbuilt and houses are built to satisfy the whims of an eccentric farmer or the caprices of his wife; thus they may be houses that an average farm purchaser does not care to buy. Almost never, therefore, will the value of the bare land added to the sound value of improvements equal full value for purposes of taxation. An adjustment must be made for obsolescence depending upon the extent to which the improvements meet the adequate needs of the farm. This constitutes the conundrum of the real estate appraiser. The answer to the question, how much value do the buildings add to the value of the bare land, must come from within the appraiser from his experience. In making comparisons between farms which have sold and farms which have not, sound value of improvements is helpful, but adjustments must be made for all elements contributing to or detracting from cost of reproduction minus de-

preciation. The most important adjustment must be made for adequacy or inadequacy, the extent to which improvements are adapted to the needs of the farm. The size of the farm, its potential productiveness, its location, scale of living in the community, etc., give value to the buildings, and not vice versa. Thus, the value placed upon improvements is the residual element and not the reverse.

The reader must not infer from this illustration that the average prices obtained in Table II would be used arbitrarily in placing values for assessment purposes on farm lands in a taxation district. An analysis of the raw data entering into Table II would seem to warrant a range for first grade land from \$60-\$80 per acre. The distribution for second grade land was peculiar, but would seem to warrant a range from \$40-\$60 per acre. The sub-classes or grades are determined on the basis of texture, fertility, and physical characteristics, but the price range makes allowance for accessibility to markets, trading centers, schools, nature and condition of highways, and other elements affecting land values. For example, \$65 per acre may be placed on first grade land on farms located on a dirt road and \$80 per acre on similar land more favorably located.

Classification of farm real estate for purposes of taxation is not advanced here as an easy way out. The assessment problem centers around the corner stone of economics—namely, value and valuation. There is not now and never has been any royal road to values. The time will perhaps never come when purely objective standards can be established on the basis of which real estate can be appraised without the element of human judgment entering into the equation. It is maintained here, however, that an adequate, comprehensive

classification of farm real estate is at present the only feasible method by which elements contributing to the value of farm real estate can be evaluated and measured on a comparative basis, which after all is the important thing in an equitable assessment.

This is especially significant at the present time and arises from conditions prevailing in the market for farm real estate. Since 1928, and in some cases back to 1921, it is not uncommon to find towns where no sales of farm real estate have occurred to reflect the community's judgment as to values. For the State of Wisconsin representative sales average two and three sales per town. If current market values continue to be the statutory standard at which farm real estate is assessed, conditions require a new method of approach. It is no longer possible to compare property sold with property which has not sold without careful analysis. It is only possible to make comparisons on the basis of the principal elements contributing to the value of property in question. The appraiser must break down his sales into distinct and separable elements; he must get all information available from those who have sold property and those who have purchased; he must get whatever information is available from realtors, bankers, courts, and last but not least, he must keep in close touch with community judgment as to values. Only through building and analyzing sales in communities where fairly homogeneous

conditions prevail can standards be established which may be used for assessment purposes. In other words, the appraiser must establish synthetic market values for farm real estate for purposes of taxation by carefully weighing and evaluating those elements contributing to or detracting from farm land values.

The Use of Field Books and Maps

Perfect results should not be expected the first year. Indeed, it is doubtful if perfect results should be expected within a decade. The results of each year's assessment should be placed in a permanent record and improved upon from year to year.⁷ For these reasons a permanently bound book called the field book should be made an important adjunct to the assessment roll. The sale analyzed on page 118 would have been entered in the field book, omitting the name and description on the left margin, according to the form illustrated in Table III.

A field book is superior to a real estate blotter. The use of real estate blotters results in a waste of labor. Each newly elected assessor will attempt a reclassification of the real estate whether he can improve upon it or not. Furthermore, if a proper classification is finally worked

⁷ Unfortunately, not all states provide for annual assessment of farm real estate. Twenty-seven states assess farm real estate annually, 9 states biennially, 2 states triennially, 7 states quadrennially, 2 states quinquennially, 1 every 6 years. But regardless of the frequency of assessments, classification must be made a continuous process until the job is completed.

TABLE III. SAMPLE IN A

D. AGRICULTURAL												E. MARSH, COUNTRY										
1st Grade		2nd Grade		3rd Grade		Wild Hay		Wild Pasture		Total		Marsh		Cut-over Good		Cut-over Poor		Total				
Acres	Value	Acres	Value	Acres	Value	Acres	Value	Acres	Value	Acres	Value of Land	Value of Improvements	Acres	Value	Acres	Value	Acres	Value	Acres	Value		
79	\$5,925	44	\$2,420	4	\$80	20	\$455	147	\$8,880	\$3,880*	NONE IN THIS CLASS							

*Carried from building data section of the field book where the principal was to improve

out for a taxation district, recopying data on blotters annually is unnecessary. In taxation districts where experienced and competent assessors have held office for several years and have an intimate knowledge of their taxation district the best possible classification in cooperation with the supervisor of assessments is worked out and made a permanent record in the field book. At the end of the assessment season the field book is turned over to the supervisor of assessments. The new assessor should not be permitted to change the classification, except as warranted by added improvements and development and unless he shows wherein the classification is defective. But good results can only be attained through interposing some sort of supervisory, administrative machinery between the Tax Commission and the local assessor. This is essential if the classification of farm real estate of taxpayers within a taxation district and between taxation districts is properly coordinated.

The use of sectional maps must be coordinated with the use of the field books. It aids in perfecting the classification of farm real estate, it lessens the likelihood of omitting property and of placing incorrect descriptions in the roll. For these reasons the use of maps is of even more importance to taxation districts which are required to locate property by metes and bounds and where regular government surveys have been made along sectional lines. Accurate

classification of farm real estate showing for each farm the number of acres of various classes and sub-classes, the use of field books and maps constitute the only feasible plan, under present conditions, whereby the productivity element of farm real estate value may be reduced to comparable and measureable terms. For some time to come classification must be to the assessor of rural property what standard front values and depth factor tables have been to the assessor of urban property.

The Location Factor in Farm Productivity

A comprehensive classification of farm real estate is designed to take care of physical characteristics affecting and contributing to farm productivity. It does not give any weight to location factors. Yet the location factor may be fully as important as the fertility factor. One hundred acres of first grade land in Kenosha County, Wisconsin, might be worth \$20,000. The same farm, if located in Iowa County, Wisconsin, might be worth not more than \$8,000 and if located in North Dakota would probably be worth not more than \$3,000. Even in the same taxation districts farms approximately equal in area and fertility, as measured by a classification of physical elements, will have different values. These differences are revealed by sales of farms as well as by professional opinion as to the worth of farms differently located. The principal location factors are as follows: (1) distance to market;

SAMPLE IN A FIELD BOOK

MARSH, CRATE				F. TIMBER						A. RESIDENTIAL, ALSO MERCANTILE AND MANUFACTURING				TOTAL VALUE FIXED BY ASSESSOR	
Value	Acres	Total	Value of Improvements	Mixed Timber	Wood	Total	Value of Land	Value of Improvements	Residential Land	Mercantile Land	Manufacturing Land	Total	Value of Land	Value of Improvements	Year 1930
				A' res	A' res	A' res									
...	12	\$240	...	12	\$240	...	NONE IN THIS CLASS			.....	.....	\$9,120 \$3,880

principal improvements are itemized. It was omitted here for sake of brevity.

(2) nature and condition of highways; (3) distance to church and school; (4) character of the people; (5) facilities for amusement; (6) type of ownership.

Of these six factors only two, "distance to market" and "nature and condition of highways", will be here considered. A federal study made in Indiana found that:

"a farm one-half mile from town averaged \$215.00 an acre in the area studied, a farm three miles from town, after the influence of the other factors affecting value had been eliminated or 'held constant' by statistical means, so that only the influence of distance alone was left, averaged about \$198.00 or \$17.00 an acre less. A farm nine miles from market averaged about \$185.00 an acre. This was about \$30.00 an acre less than a substantially similar farm a half mile from town, and about \$13.00 an acre less than the same kind of a farm was worth three miles from town."⁸

"In Blue Earth County, Minnesota, farms on state gravel roads, other things equal, were worth \$22.00 more per acre than farms on dirt roads. In Chester County, Pennsylvania, farms on gravel roads or broken stone roads were worth \$15.00 per acre more than the same kind of farms on dirt roads and farms on concrete, or other hard-surfaced roads, were worth \$16.00 more than on gravel." The Minnesota study mentioned above furthermore found that "land tributary to the large towns averaged \$13.00 more per acre than land tributary to smaller towns and, furthermore, farms on dirt roads and adjoining smaller towns each mile from town decreased land values \$3.42 per acre."⁹

It should not be overlooked, however,

⁸ "Methods of Appraisal and Their Application to Farm Real Estate Values," address, Bankers and Land Appraisers Short Course, University of Illinois, E. H. Weicking, Mimeographed Report, November 8, 1929, p. 12.

⁹ *Farm Economics*, No. 52, p. 1053, Department of Agricultural Economics and Farm Management, New York State College of Agriculture, Cornell University, 1928.

¹⁰ It should be noted that comparisons are here made between hard-surfaced roads and *dirt roads*. As a general rule, a concrete road adds little value to farm real estate

that a comprehensive classification of agricultural real estate results in giving more weight to those factors—namely, "nature and condition of roads" and "accessibility to market"—than is commonly supposed. A study recently made in New York showed that the acres of pasture per cattle unit increased and the production per cow decreased as the mileage of dirt roads increased.¹⁰ Farmers living on a paved road had as a rule a larger percentage of tillable land and aimed to stabilize the dairy industry by maintaining a more even flow throughout the year, while farmers living on dirt roads were required to concentrate more heavily on summer dairying. With an increase in mileage of dirt roads the cows per farm decreased as did also the percentage of fluid milk sold.¹¹

Data taken from field books and appraisal cards of farms in the fluid milk zone of Wisconsin seem to substantiate the results found in the New York investigations. Field books and inspection cards show that farms located on dirt roads have a higher proportion of pasture land and a smaller proportion of tillable land than farms located on concrete roads. Therefore, the fact should not be overlooked that when property is classified for purposes of taxation, weight is given to nature and condition of highways. If a farm located on a side dirt road possesses relatively more permanent pasture, an accurate classification

not added by a good gravel road. Innumerable instances could be cited where farms on concrete roads enjoying direct benefits from snow removal have an advantage over farms on side roads and in trucking localities a farmer may value the opportunity to sell from a stand on the roadside; thus a location on a well traveled concrete road may be considered an advantage. But when a concrete road divides a dairy farm, and especially when the road goes between the house and barn or between the barn and pasture, the value added by the concrete road is problematic.

¹¹ A Statistical Study of Milk Production for New York Markets, *Cornell University Experiment Station Bulletin*, No. 518, April, 1931, pp. 65 and 66.

of farm real estate gives weight to the road factor since a lower unit price per acre is applied to pasture land than to plow land.

The Use of Arbitrary Differentials Per Acre

There are conditions, however, which would justify the use of arbitrary differentials per acre for tillable lands on farms located on dirt roads. Some might question the legality of this in states where the statute stipulates assessment at full value. But if the present scarcity of usable sales continues in many farming communities, the problem will become one of equalization rather than assessment at full value. Professors Warren and Pearson have pointed out that "the value of hard surfaced roads to farmers is much more than the difference in land prices would indicate, because the differences in prices per acre at which farms sell are much less than the difference in values for use. Poor farms usually sell for more than they are worth for use when compared with good farms."¹² Sales analyzed in Wisconsin indicate that too often this is true. The farmer is to a large extent dominated by non-economic motives. Land values are to such a large extent the result of a state of mind and, if the state of mind places the same value on a farm located on dirt roads as it would if the farm were located on a hard-surfaced road, perhaps that state of mind should be changed. The establishment of arbitrary differentials per acre would have an effect on the community's judgment as to values and it would not be long before an arbitrary differential would cease to be arbitrary but a reflection of real differences in values. Courts in practically all states recognize the use of

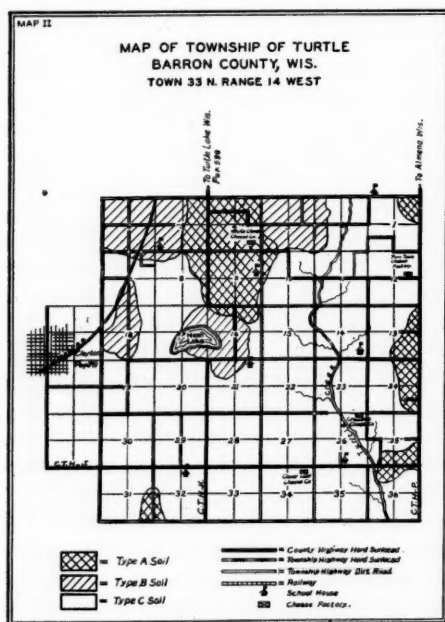
other elements such as cost, physical condition, etc., as factors in determining values for assessment purposes. Since the condition of the road affects the income of the property in question, it should be considered as a criterion reflecting market values. The setting up of arbitrary differentials in cities has proven superior to the old "hit and miss" methods and the principle has never been questioned by the courts. In view of the absence of a sufficient volume of usable sales in farm communities, it seems as though the same principle should be utilized in assessing farm real estate.

The Use of Taxation District Maps

To what extent is it practicable under present conditions to establish a system of zoning, a sort of classification on a distance basis, in addition to physical classification of farm real estate? This question is difficult to answer. These differentials will be hard to establish for they will vary from one community to another. They will vary also with the type of agriculture. Some supervisors of assessments in Wisconsin have succeeded in interesting the local assessor and town authorities sufficiently that maps have been made of the entire taxation district in addition to sectional maps and field books. In towns which have special assessment problems, these maps are sometimes made by the supervisor of assessments but more often by the local assessor cooperating with the supervisor. Maps showing trading centers, churches, principal roads by type of construction, representative sales during recent years, principal physiographic features, such as soil types, swamps, timber, cut-over areas, are indispensable to a local assessor in towns where diverse conditions prevail. These township maps might be called equalization maps.

¹² Warren and Pearson, *Farm Economics*, No. 52, p. 1053; *op. cit.*, p. 18.

They serve somewhat the same purpose for towns as maps for a city showing front foot values. Map II is a reproduction of a map sent to the writer by Wm. F. Rolf, Assessor of the Town of Turtle Lake, Barron County, Wisconsin. Mr. Rolf writes, "I believe every assessor should have a sketch of his township with all necessary details on it hanging in his room where he works over his books." The principal elements affecting land values are presented here, three principal types of soil, main types of highways, schools, creamery, proximity to trading centers, which, however, lie outside the township, creek bottoms, etc.



The soil in the township is divided into three main types, "A," "B," and "C." A more detailed classification of these soils is presented in the field book, but the sketch is valuable in establishing comparative unit values in different parts of the township. Five distinct areas of Type A soils are depicted, con-

sisting of highly productive heavy clay soil on which he has established a base value of \$70 per acre. Four distinct areas of Type B soil are represented, consisting of good sandy loam soil with a base price of \$60 per acre. The balance of the township consists of Type C soil, quite rough and stony, containing also considerable creek bottom. The base price here is \$50 per acre. With minor exceptions the best lands are also favored with the best highways. The reader may rest assured that the property tax in this Township does not resolve itself into a per capita tax, which is the tendency in the great bulk of rural taxing districts and is fast bringing the property tax into disrepute.

Many Wisconsin supervisors of assessment are in position to recommend value differentials per acre for some of their taxation districts. In some cases a differential as high as \$20 per acre for first grade land is set up. That is, a farm located on a dirt road which is virtually impassable part of the year is worth \$20 per acre less (first grade land) than one located on a hard-surfaced road. No differential is recognized for pasture lands. The usual differential, however, is \$10 per acre for plow land. This is considered ample, since classification results in giving weight indirectly to the road factor as explained above. In taxation districts having all hard-surfaced roads, "accessibility to markets" is not as important as it was prior to the motor era. The farmer's time has a more important bearing on land values than distance in miles. This is not true, however, in taxation districts having dirt roads. Taxation districts, having mainly dirt roads and where the community surrounds an important market or trading center, should recognize a differential of \$3 to \$5 per mile per acre, depending upon local conditions.

Conclusions

Suggestions advanced in this paper may be objected to on the grounds of expense to the local taxation district. The costs, however, of classifying farm real estate for the purpose of taxation, of making sectional maps and taxation district maps will only mean a higher first cost. It will cost more while the work is being done, but after it is completed the cost of assessing a taxation district will be less—especially in older, well established communities.

Secondly, classification of farm real estate may be objected to on the grounds that it adds to the difficulties of assessing farm real estate rather than removing them. This objection has some force if the classification attempted is made too complex. The average town assessor in Wisconsin does a fair job at differentiating between the main subclasses of agricultural land—namely, plow land, wild hay, and wild pasture. This of itself would justify classification and constitutes a step forward. Also the local assessor, as a rule, differentiates readily between the agricultural, cut-over, and timber lands. When, however, it comes to differentiating between the three grades of plow land—namely, 1st, 2nd and 3rd—supervision by the Tax Commission is needed if the classification between taxation districts is properly coordinated. The success or failure of any comprehensive scheme of classification will depend ultimately on the nature and effectiveness of supervision by the Tax Commission.

But regardless of the difficulties or expense incurred it is well worth the effort. Despite the fact that property remains with minor exceptions the taxing base from which is derived the great bulk of revenues for rural taxing districts, this mode of taxation has failed to receive the attention it well deserves. This arises from inherent characteristics

in this mode of taxation, since there is little connection between efficient administration and revenue yield. Tax levies are predetermined and any improvement in administration results merely in spreading the tax load more evenly among individuals and taxation districts. Accordingly, any improvement in supervision and administration must be advocated on general principles of equity and justice. In the case of newer forms of taxation resorted to by states, such as incomes, inheritances, franchises, sales taxes, a direct connection exists between the vigilance exercised by the taxing authorities and the amount of revenue produced. While these supplementary sources of revenue were designed to reduce the burden on real estate, this has been more than offset by the rapid rise of public expenditures. If these supplementary sources of revenue prove inadequate to meet the costs of government, the land owner is usually called upon to make up the deficiency. The evil day may be postponed through tax limitation laws and increase in indebtedness, but in the end property may be called upon to pay both principal and interest. Indeed, property as a tax base is fast becoming a dumping ground in public finance. In view of the increased load which property is called upon to bear, whether sound or not on theoretical grounds, emphasis has been placed in this paper on the need of more equitable assessments. The classification of farm real estate along the lines suggested—namely, breaking up rural property into distinct elements, more objective data to facilitate comparisons, more publicity at public meetings and boards of review, more supervision by the various tax commissions—appears to be the only feasible plan under present conditions for distributing the tax burden more equitably.

Small Country Banks in a New Age

By VIRGIL P. LEE

LOW farm prices, poor general business conditions, and poor bank management are insufficient explanations of the present difficulties of country banks. Before the present depression we have had low prices, poor business, and probably poorer bank management without such destructive inroads on the banking business. Something fundamental has happened to the country banking business itself since 1914, to make hundreds of banks peculiarly susceptible to collapse under the pressure of poor business conditions. Unavoidable increases in expenses and decreases in charges for services have put country banks in the extremely difficult position of having their margin of earnings sliced concurrently from both ends.

From pre-war days to the 1920's bank expenses increased in keeping with expenses in other business, but banks, particularly western and southern country banks, have the unique distinction of reducing the charges for their services. The "par collection" system of the federal reserve banks greatly reduced country bank income from "exchange and collections," and country bank income in western and southern communities, in particular, was further reduced by a gradual but noticeable decline in the rate on loans. Also, in most of these states, country bank income was reduced through an increase in the portion of total loans and investments which was in the form of low-interest-bearing investments.

In the transition from the pre-war period to the 1920's merchants and man-

ufacturers protected profits from the inroads of higher expenses by raising prices and by increasing the volume of business. Country bankers, however, faced an actual decline in charges which shifted the double burden of increased expenses and decreased income to the mercies of a greater volume of business.

During the 1920's the total country banking business was much greater than in pre-war days, but not sufficiently greater to meet the new volume requirements for the number of banks in operation. Fortunately, a large number of banks were able to increase their volume sufficiently to maintain approximately the same expense per dollar of business that they had before the war. Fortunately, also, they could counteract declining gross earnings per unit of business by increasing the ratio of earning assets to bank investment. That is, their big increase in volume of business from pre-war times to the 1920's was achieved without a similar increase in capital and surplus.

On the other hand, thousands of banks have not been able to get the required volume. Despite the necessity of increasing their volume, many banks have actually had a decline. In many communities the situation has been aggravated by the development of good roads and extensive use of automobiles which have taken former customers to larger towns. The best sort of bank management, with good agricultural prices and general prosperity, could scarcely make paying units out of many small country banks in the face of the increased volume requirements.

*Expenses and Earnings in
1914 and in 1926*

The *Annual Reports* of the Comptroller of the Currency show that average net earnings to country national bank capital, surplus, and undivided profits in 1926-1928 were 7½% as compared with 7¼% in 1914-1916. This good showing was attributable to the increase in the ratio of loans and investments to bank capital (Table I).

TABLE I. AVERAGE COUNTRY NATIONAL BANK EARNINGS AND EXPENSES, 1914-1916, AND 1926-1928.*

	1914-1916	1926-1928
Gross earnings per dollar of loans and investments.....	7.44 cts.	6.93 cts.
Expenses per dollar of loans and investments.....	4.52 cts.	4.99 cts.
Volume of loans and investments per bank.....	\$557,000	\$1,247,000
Ratio of loans and investments to capital, surplus, and undivided profits.....	3.53 cts.	5.77 cts.
Net earnings per dollar of loans and investments required to yield 8% on capital, surplus, and undivided profits.....	2.27 cts.	1.38 cts.

*Compiled from *Annual Reports* of the Comptroller of the Currency.

But these are averages for all kinds of country national banks and for all sections of the country. Thousands of banks failed to increase their volume sufficiently to hold expenses per unit to a reasonable level and to increase the ratio of business to the bank investment. Unfortunately, country banks in those sections of the country where gross earnings per unit of business declined most were least able to obtain the necessary volume of business. Table II shows the situation among Texas and Montana country national banks.

But again these are state averages and only for national banks. In January, 1929, approximately 75% of all state and national banks in Texas had less than \$600,000 in deposits. It is estimated further that about 80% of all banks in the State had less than the average of \$562,000 in loans and in-

TABLE II. TEXAS AND MONTANA COUNTRY NATIONAL BANK EARNINGS AND EXPENSES, 1914-1916 AND 1926-1928.

	Texas		Montana	
	1914-1916	1926-1928	1914-1916	1926-1928
Gross earnings per dollar of loans and investments.....	10.49 cts.	8.44 cts.	10.16 cts.	7.40 cts.
Expenses per dollar of loans and investments.....	5.60 cts.	5.77 cts.	5.84 cts.	5.43 cts.
Net earnings per dollar of loans and investments.....	4.89 cts.	2.67 cts.	4.32 cts.	1.97 cts.
Decrease in net earnings.....	.....	45%	.....	50%
Average volume of loans and investments per bank	\$301,000	\$562,000	\$568,000	\$802,000

vestments which was the figure given in Table II for national banks.

*Liquidations Heavier Among
Small Banks*

Volume of business in banking may be measured by (1) total loans and investments, (2) total deposits, or (3) total earning assets, which means loans and investments plus interest-bearing deposits in other banks and miscellaneous earning assets such as real estate. In collecting figures on volume of business of individual country banks for this study it was impossible to use the same measure in all cases. In order to avoid confusion it is necessary to remember that for the small Texas country bank the deposits figure is commonly 10% to 20% less than total earning assets and the loans-and-investments figure is approximately the same as total deposits.

That the smaller country banks in Texas have suffered much more than the larger banks is indicated by the record of liquidations during 1929 and 1930 (Table III).

One-fourth of the banks with less than \$100,000 deposits in January, 1929 were liquidated during the next two years. Approximately 50% of the banks in the State had less than \$300,000 deposits in January, 1929, while 75% of the total number of liquidations during 1929 and

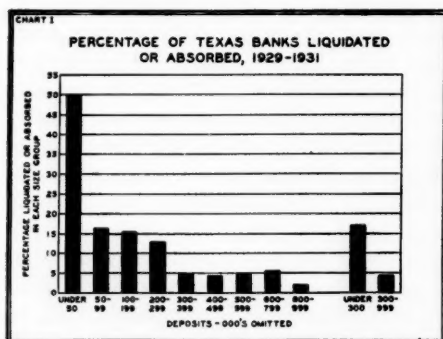
TABLE III. TEXAS COUNTRY BANK LIQUIDATIONS, 1929-1930.

Volume of Deposits	Number of Banks in Texas 1929	Number Liquidated	Percentage Liquidated	Cumulative Percentage of All Banks	Cumulative Percentage of Banks Liquidated
Less than \$50,000.....	38	19	50.00	3.05	13.57
50,000—100,000.....	103	17	16.51	11.32	25.71
100,000—200,000.....	283	44	15.55	34.03	57.14
200,000—300,000.....	192	25	13.02	49.44	75.00
300,000—600,000.....	317	15	4.73	74.88	85.71
600,000—1,000,000.....	157	7	4.46	87.48	90.71
1,000,000 or more.....	156	13	8.33	100.00	100.00
Total.....	1,246*	140†			

*Nineteen additional banks did not report their deposits.

†Seven small banks did not report their deposits.

1930 occurred among these banks. This indicates that the rate of liquidation was three times as great among banks with less than \$300,000 deposits as among banks with more than \$300,000 deposits (Chart I).

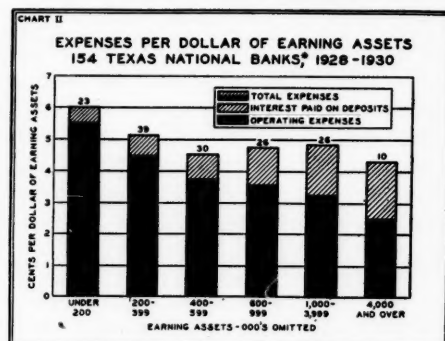


During the comparatively prosperous years of 1923 to 1929, 95 Texas state banks were closed and liquidated by the Department of Banking. Four-fifths of these banks had less than \$300,000 deposits one to two years before suspension, two-thirds had less than \$200,000, and 44% had less than \$100,000.

Relation of Volume of Business to Profits

A detailed study of expenses and earnings of 154 Texas country national banks from June 30, 1928 to June 30,

1930 reveals the weaknesses of very small banks (Chart II). Average annual expenses, exclusive of interest payments



*The numbers at the top of each bar indicate the number of banks in each size group.

to depositors, were 5.5% of total earning assets for banks with less than \$200,000 in earning assets, as compared with 3.74% for banks with \$400,000 to \$600,000 in earning assets. That is, operating expenses per unit of business were almost 50% higher among the smaller banks. Such expenses for banks with less than \$400,000 in earning assets averaged 5.00% of earning assets as compared with 3.64% for banks with \$400,000 to \$1,000,000 in earning assets. The average ratio of earning assets to bank investment was 3.49 in the former group as compared with 4.44 in the latter group.

Most of the very small banks are further handicapped by a small ratio of total business to bank investment. Thus the 616 Texas country banks with less than \$300,000 deposits in January, 1929 had an average ratio of deposits to capital and surplus of about 3.5 contrasted with 5.7 for banks with \$300,000 to \$1,000,000 deposits. As the total deposits figure is somewhat lower than total earning assets, the ratios of earning assets to capital and surplus for these two groups are estimated at about 4 and 6 respectively. This means that the

smaller banks would require a net earnings margin of two cents per dollar of earning assets in order to earn 8% on the bank investment, while the larger banks could earn 8% with a net of 1.33 cents per dollar of business. In other words, the smaller banks must have a 50% higher net margin in order to have the same earnings on the bank investment. This is a serious handicap. The 141 banks with less than \$100,000 deposits had a ratio of earning assets to bank investment of about three, while the corresponding ratio for banks with \$800,000 to \$1,000,000 was approximately seven.

Among the 154 Texas national banks studied, the actual net profit to bank investment was 3.89% for banks with less than \$250,000 in loans and investments; for banks with \$500,000 to \$750,000 in loans and investments it was 6.25%. Average net profit for all banks with less than \$500,000 in loans and investments was 3.93% and for banks with \$500,000 to \$3,000,000 it was 7%.

The performance of the small banks looks still more unsatisfactory when it is considered that the banks with less than \$500,000 in loans and investments charged borrowers an average of 9.36% on loans, while banks with \$500,000 to \$3,000,000 charged 8.45%. Furthermore, banks with less than \$500,000 paid out to depositors an average of only 0.57 cents per dollar of loans and investments as compared with 1.22 cents for banks with \$500,000 to \$3,000,000. These figures show a striking contrast in the service of smaller and larger banks to all concerned—stockholders, borrowers, and depositors.

The Future

With the lower general price level which is likely to prevail in the present decade relative to the last decade, coun-

try bankers should get some relief through reduced expenses. Reductions will likely be greatest in the price of supplies and in wages for clerical help. On the other hand, there is little probability of much reduction in the salary of the manager or in taxes. Interest payments on deposits will be forcibly reduced in some sections, particularly in parts of the Middle West where they have been excessive. But competition is likely to increase such payments in other sections, such as Texas, where many banks have been paying little or nothing.

As for gross income, there is little likelihood of an increase in the return on loans and investments. In fact, the reverse may be expected. Increased competition with banks in the larger centers is likely to force a gradual decline in the rate on local loans, particularly in those sections where the rate has been 8 to 10% during the past decade. Also, the gross return per dollar of loans and investments is likely to be reduced further by an increase in the percentage of total earning assets which is in the form of bonds and other securities. This trend has been very noticeable during the past two decades and it is likely to continue in the newer agricultural regions.

Thus the necessity of a larger volume of business per bank seems to be here to stay. Adjustments to this end are now going forward rapidly through liquidations and consolidations of the smaller banks. Also, government supervising bodies are following a much stricter policy in issuing charters for new banks in communities which already have banking facilities. We are gradually learning that too many competitors are often the "death of trade" in the banking business. Better transportation facilities are increasing the competition between banks of adjoining communities. This competition affords protection

to bank customers and in turn allows a town to get along with one large bank where it formerly had two small ones.

Government banking departments are generally charged with the overbanked condition of agricultural communities which prevents bankers from getting a volume of business in keeping with narrowing operating margins. Under 1910 rules of what constituted an economic

banking unit, the increase in the number of banks from 1910 to 1920 was probably justified. And who could have anticipated the narrowing of operating margins which has prevailed since 1920? The experience of the past 10 years, however, should furnish an adequate basis for establishing a new conception of volume requirements to be followed by bankers and bank supervisors.

The Los Angeles Bureau of Power and Light: Financial Results of Operation

By MARTIN G. GLAESER

NO other public venture in the production, distribution, and sale of electricity in the United States can compare in financial magnitude with the operations of the Bureau of Power and Light. Unlike many other examples of public enterprise, this utility bears none of the earmarks of either pioneering uncertainty or of arrested development. It was caught in the full flood of community expansion and it benefited also from the war-borne and post-war prosperity of the past decade. Whatever faults may have crept into its organization, planning, and administration, whatever difficulties may have beset its path, no candid observer can deny that its promoters have shown initiative and have possessed a vision for the future. By all the criteria of financial achievement, this utility has become a going concern.

This necessarily brief account of the principal facts in the Bureau's financial history is based primarily upon the published reports of audits conducted on behalf of the Commission of Water and Power by Price, Waterhouse and Company and Lybrand, Ross Brothers and Montgomery. These audits of the accounts were of the usual type where the examination is conducted for the benefit of bankers and stockholders. The reports specifically state that the "examination was of a nature as would determine the substantial accuracy or otherwise of the records, but was not of such a detailed character as would necessarily disclose any minor irregularities or inaccuracies should any exist." The

facts, interpretations and opinions contained in these audits were supplemented by information drawn from other published and unpublished sources and by conclusions derived from first hand contacts and personal investigations on the ground. This examination of the Bureau's financial affairs makes no pretense of having been exhaustive. But it has been critical, the writer having looked upon both sides of mooted questions.

In a previous article¹ the operating history was divided roughly into a period of competitive beginnings from 1917 to 1923 and a period of normal operation under stabilized competitive conditions beginning with the fiscal year 1924. Roughly the same division holds good for the financial history. For nearly five years, terminating on May 15, 1922, the major portion of the property was in the possession and charge of the Southern California Edison Company under the terms of an operating agreement, though subject to an acquisition contract. For this and other reasons the accounting set-up of the concern had not settled down to those routine procedures and standardizations which best provide the factual material upon which a probative financial history may be based. Nevertheless, the younger Power Bureau was in this respect distinctly in advance of the Water Bureau.

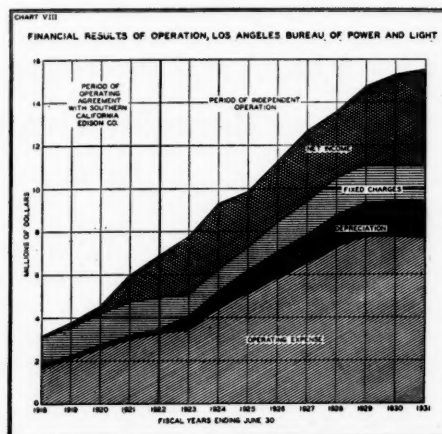
Fortunately, as already indicated, the Board in control of these properties in-

¹ *Journal of Land & Public Utility Economics* 249 (August, 1931). Charts and tables in this article are numbered consecutively after those in earlier articles.

vited auditing firms of unquestioned independence and standing in the profession to effect such rearrangements in future accounting, as well as in the accounts of the past, and to report the financial results of operation, that an outline of the financial history may be attempted. For the second of the above periods the accounting facts match, if they do not surpass, in accuracy and completeness comparable facts provided by private industry. To be sure, the accounting and reporting are not above criticism. Some of the more material of these criticisms will be reviewed in the final installment of this series.

Financial Results of Operation

A condensed summary of the financial results of operation appears in Table V and is also shown diagrammatically on Chart VIII. It is interesting to observe from the chart how the gross revenues have been distributed among the major accounting categories. A few comments should, however, be added by way of interpretation. The first of the audit reports, showing the financial condition



as of June 30, 1918, covers operations for a period of approximately 15 months. In order not to distort the picture the figures for 1918, upon which the chart is based, have been adjusted to a 12-months' basis.

Since May, 1917, the Southern California Edison Company distributed the greater portion of the electric energy generated on the aqueduct under an operating arrangement which did not terminate until 1922. It should also be

TABLE V. FINANCIAL RESULTS OF OPERATION, LOS ANGELES BUREAU OF POWER AND LIGHT.

Fiscal Year Ending June 30	Gross Revenues (\$)	Operating Expenses (\$)	Depreciation and Fixed Charges (\$)	Net Income (\$)	Cumulative Net Income (\$)
1918*	3,904,248.80	2,130,312.20	1,701,145.73	72,790.87	72,790.87
1919	3,778,084.74	2,074,335.63	1,488,601.89	215,138.22	287,929.09
1920	4,509,698.61	2,578,465.19	1,622,116.63	309,116.79	597,045.88
1921	5,974,450.00	3,010,760.52	1,755,404.83	1,208,284.65	1,805,330.53
1922	6,880,940.74	3,247,861.00	1,708,829.85	1,924,249.89	3,729,580.42
1923	7,762,606.97	3,439,055.33	1,629,928.30	2,693,623.34	6,423,203.76
1924	9,302,092.29	4,476,738.65	1,774,047.19	3,051,306.45	9,474,510.21
1925	10,017,484.58	5,136,984.70	2,144,532.12	2,735,967.76	12,210,477.97
1926	11,237,158.89	5,836,131.18	2,604,574.85	2,796,452.86	15,006,930.83
1927	12,658,994.82	6,504,885.91	2,895,620.48	3,258,488.43	18,265,419.26
1928	13,558,049.44	7,023,274.13	3,473,046.40	3,061,728.91	20,397,277.52
1929	14,737,762.58	7,528,079.23	3,582,711.12	3,626,972.23	24,024,249.70
1930	15,295,009.41	7,761,377.64	3,309,132.95	4,224,498.82	28,248,748.57
1931	15,451,917.85	7,640,233.61	3,467,394.45	4,344,289.79	32,543,037.77

*Fifteen months ended June 30, 1918.

TABLE VI. FINANCIAL RESULTS UNDER THE OPERATING AGREEMENT WITH THE SOUTHERN CALIFORNIA EDISON COMPANY

Year	Gross Operating Revenues	Operating Expenses	Depreciation	Interest	Net Income
1918.....	\$3,596,114.59	\$ 957,689.45	\$333,608.70	\$803,391.54	\$1,501,424.90
1919.....	3,287,302.58	902,802.54	295,892.39	712,305.60	1,376,302.05
1920.....	3,876,365.75	1,042,724.71	303,307.70	810,561.22	1,719,772.12
1921.....	5,061,439.64	1,297,920.13	316,910.50	842,948.86	2,603,660.15
1922.....	5,230,717.92	1,341,254.00	281,370.45	768,596.27	2,839,497.20

noted that the earning capacity of the aqueduct project did not fully appear until San Francisquito Power Plant No. 2 was completed in June, 1920. The net revenues obtained from the Edison Company represent sums remaining after deducting from the operating revenues earned by its lines within the City the distribution expenses incurred, the cost of additional power furnished by the Edison Company, plus an 8% interest rate and a 3.36% depreciation rate on an agreed valuation of Edison Company property under contract. The financial results under the operating agreement alone are shown in Table VI.

Depreciation Charges

The auditors made certain adjustments in the books of account which resulted progressively in improvements in the authenticity of the records. For instance, in one of their earliest reports covering operations as of June 30, 1921, they include all bond redemptions and interest payments made on behalf of the Bureau by the City out of taxes. They also take up in construction costs interest on bonds outstanding during the construction period. During the earlier years, the Bureau's accounts made no allowance for depreciation except as

TABLE VII. ANNUAL DEPRECIATION ALLOWANCE AND ACCUMULATING DEPRECIATION RESERVE IN RELATION TO PLANT AND EQUIPMENT

Year	Plant and Equipment Account*	Depreciation Account	Percentage of Plant and Equipment	Depreciation Reserve Account	Percentage of Plant and Equipment
1918.....	\$7,520,901	\$ 116,319†	1.55%	.....	.....
1919.....	7,939,178	127,452†	1.61	.....	.....
1920.....	8,676,877	159,746†	1.84	.....	.....
1921.....	12,589,410	223,539†	1.78	\$ 519,396	4.13%
1922.....	25,754,726‡	176,594†	1.29	658,739	4.80
1923.....	30,968,604	622,029	2.01	981,977	3.17
1924.....	35,132,238	732,750	2.09	1,514,181	4.31
1925.....	41,374,852	1,035,709	2.50	2,117,991	5.12
1926.....	48,562,748	1,186,106	2.44	2,893,564	5.96
1927.....	55,866,384	1,321,181	2.36	3,415,902	6.11
1928.....	61,359,459	1,442,026	2.35	3,979,860	6.49
1929.....	65,656,459	1,567,832	2.39	4,943,148	7.53
1930.....	68,248,660	1,651,557	2.42	6,053,241	8.87
1931.....	71,784,138	1,785,210	2.49	7,324,231	10.20

*The data on Plant and Equipment are the amounts standing in the account at the end of the year.

†Includes loss on plant and equipment dismantled or abandoned.

‡Ratios are based upon Plant and Equipment Account reduced by purchase price of Edison property.

they carried losses on plant and equipment dismantled or abandoned. This was rectified later, first in a tentative estimate made for 1921, and then in a final estimate for 1923, which was based upon a deeper study of the character and condition of the properties.

The lives assigned to the various classes of properties were as follows:

Dams, canals, tunnels, and syphons.....	75 years
Buildings.....	50-75 years
Transmission lines.....	75 years
Distribution system.....	17-21 years
Miscellaneous equipment.....	10-25 years
Power-house, transmission, and substation equipment.....	25-35 years

The depreciation rate was computed upon a 5% sinking fund basis, as formulated and used by the Railroad Commission of California. The amount of the annual depreciation allowance and the accumulating depreciation reserve are shown in Table VII in relation to the investment in plant and equipment.

In judging the adequacy of these depreciation reservations we must not lose sight of the fact that the purchase of the Los Angeles distributing system of the Edison Company took place as of the

close of business May 15, 1922. The consideration was arrived at as follows:

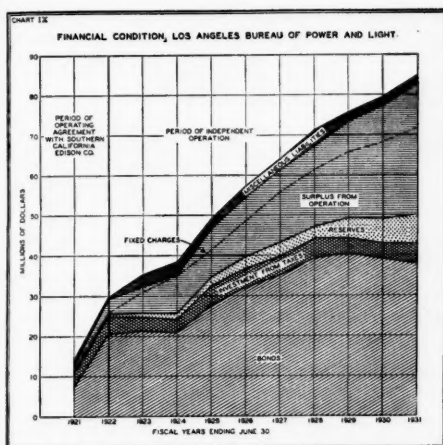
Agreed purchase price as at July, 1919.....	\$11,000,000.00
Additions and adjustments to May 15, 1922 net.....	1,793,237.91
	12,793,237.91
Less-Balance of Edison Co. depreciation reserve.....	749,367.94
Purchase price.....	\$12,043,869.97

Balance Sheet Analysis

A condensed statement of the financial condition of the Bureau of Power and Light, beginning with the fiscal year 1921, will be found in Table VIII. The earliest balance sheet derived from an audit report is for 1921. These facts are also shown diagrammatically again on Chart IX. The table and chart are self-explanatory. Perhaps a word ought to be added regarding the make-up of the item, Investment of City. This is the balance remaining of an appropriation for preliminary investigation of some \$80,000, and of payment out of taxes of annual interest and bond redemption requirements, less any payments by the Bureau into the general fund of the City. The significant in-

TABLE VIII. STATEMENT OF FINANCIAL CONDITION (Fiscal year ending June 30)

ASSETS:	1921	1922	1923	1924	1925
Plant and equipment.....	\$12,589,410.10	\$25,754,726.27	\$30,968,604.14	\$35,132,204.81	\$41,852,400.00
Materials and supplies.....	1,078,023.51	1,429,188.29	2,203,899.48	1,929,204.48	2,481,713.90
Current assets.....	320,149.90	797,971.70	847,452.82	780,537.12	37,172.30
Miscellaneous assets.....	182,654.60	1,257,423.98	731,088.05	194,900.11	211,228.20
Deferred assets.....	31,381.83	285,777.34	589,404.39	366,809.92	59,926.50
TOTAL ASSETS	\$14,201,619.94	\$29,525,087.58	\$35,340,448.88	\$38,403,800.82	\$46,545,312.90
LIABILITIES:					
Bonds outstanding.....	7,351,000.00	20,501,000.00	21,300,000.00	20,950,000.00	21,500,000.00
Current liabilities.....	641,836.77	432,907.92	2,085,213.22	1,747,407.33	369,900.00
Miscellaneous liabilities.....	362,822.66	361,768.49	997,211.48	1,446,907.71	1,713,900.00
Reserve for depreciation.....	519,395.84	658,739.11	981,976.53	1,514,100.00	1,990,900.00
Investment of City.....	3,521,234.14	3,841,091.64	3,552,843.89	3,270,900.00	3,992,500.00
Surplus from operation.....	1,805,330.53	3,729,580.42	6,423,203.76	9,474,500.00	10,477,900.00
TOTAL LIABILITIES	\$14,201,619.94	\$29,525,087.58	\$35,340,448.88	\$38,403,800.82	\$46,545,312.90



crease in the amount shown for 1931 is largely accounted for by the inclusion for the first time of an item of \$1,178,944.32 of donations in aid of construction. (Line in chart shows fixed capital, not charges.)

Financial Ratios

Finally, in order to show the remunerativeness of this enterprise as an investment of capital we present in Table IX various business and financial ratios. They begin with the year 1923 because operations prior thereto were rather abnormal. In figuring the financial ratios

which indicate profitableness we have used average total book assets as a base for figuring the rate of return and average city equity in figuring the return on the proprietary interest of the City. The city equity includes the balance sheet items of Investment of City and Surplus from Operations. The operating ratio was figured by including depreciation in operating expense. This being a municipal enterprise there are no taxes to be considered in showing the actual pecuniary outlay. The bearing of this consideration, as well as others of similar tenor, will be taken up in the next article.

The capital ratio gives an expression of the number of dollars invested on the average in fixed property and plant per dollar of gross operating revenues. Since this is a hydro-electric utility, the capital ratios shown may appear surprisingly low and the operating ratios surprisingly high. Ordinarily, an electric utility, producing and distributing hydro-electric power, will show a high capital ratio and a low operating ratio as contrasted with carbo-electric plants, the reason being that the operating cost represented by fuel and labor in the steam plant has been converted into the fixed capital

LOS ANGELES BUREAU OF POWER AND LIGHT.
(Fiscal year ending June 30)

1924	1925	1926	1927	1928	1929	1930	1931
\$35,132.20	\$4,852.41	\$48,562,747.50	\$55,866,384.32	\$61,359,459.11	\$65,656,458.68	\$68,248,659.63	\$71,784,137.61
1,929,204.81	2,362,212.64	2,362,212.64	2,367,257.36	2,733,564.73	2,148,036.71	2,072,511.47	2,027,534.63
780,537.12	2,871,540.96	2,871,540.96	2,308,856.65	2,375,973.63	2,937,486.46	4,432,382.99	6,303,021.53
194,930.11	3,361,248.69	3,361,248.69	3,261,976.33	4,715,704.21	4,548,687.76	4,388,499.57	4,079,654.90
366,829.26	258,803.83	258,803.83	300,193.97	305,227.40	361,495.08	391,096.81	542,445.76
\$38,403,806.54	\$7,545.32	\$57,416,553.62	\$64,104,668.63	\$71,489,929.08	\$75,652,164.69	\$79,533,150.47	\$84,736,794.43
20,950,000.00	32,150,000.00	32,150,000.00	35,072,000.00	39,396,000.00	40,613,000.00	39,294,000.00	37,955,000.00
1,747,200.00	1,973,760.71	1,973,760.71	2,075,654.19	2,435,525.09	1,919,605.60	2,002,353.52	1,707,316.67
1,446,900.00	655,538.59	655,538.59	538,933.70	1,544,507.35	415,401.50	214,756.61	343,713.47
1,514,100.00	2,893,564.03	2,893,564.03	3,415,902.02	3,979,859.66	4,943,148.38	6,053,241.16	7,324,231.00
3,270,900.00	4,736,759.46	4,736,759.46	4,736,759.46	3,736,759.46	3,736,759.46	3,720,050.61	4,863,495.52
9,474,500.00	15,006,930.83	15,006,930.83	18,265,419.26	20,397,277.52	24,024,249.75	28,248,748.57	32,543,037.77
\$38,403,806.54	\$7,545.32	\$57,416,553.62	\$64,104,668.63	\$71,489,929.08	\$75,652,164.69	\$79,533,150.47	\$84,736,794.43

TABLE IX. BUSINESS AND FINANCIAL RATIOS, LOS ANGELES BUREAU OF POWER AND LIGHT.

Year	Average Total Assets (\$)	Average City Equity (\$)	Net Income after Depreci- ation (\$)	Interest on Funded Debt (\$)	Net Income after Depreci- ation and Interest (\$)	Capital Ratio - (%)	Operat- ing Ratio (%)	Rate of Return (%)	Average Nominal Interest Rate (%)	Return on Equity (%)
1923..	32,432,768	8,773,360	3,701,523	994,331	2,693,623	2.74	52.32	11.41	4.76	30.70
1924..	36,872,126	11,360,761	4,092,604	1,000,107	3,051,306	2.81	56.00	11.12	4.73	26.86
1925..	43,790,174	14,878,973	3,844,791	1,093,420	2,735,968	2.62	61.62	8.78	4.50	18.39
1926..	53,296,549	18,378,080	4,214,922	1,401,609	2,796,453	2.50	62.49	7.91	4.68	15.22
1927..	60,760,611	21,372,935	4,832,928	1,548,076	3,258,488	2.42	61.82	7.95	4.61	15.25
1928..	67,797,299	23,568,108	4,817,943	1,746,044	3,061,729	2.31	62.44	7.11	4.69	12.99
1929..	73,571,047	25,947,523	5,388,453	1,761,481	3,626,972	2.32	61.72	7.32	4.40	13.98
1930..	77,592,658	29,864,904	5,882,075	1,810,636	4,224,499	2.28	61.54	7.58	4.53	14.15
1931..	82,134,972	34,687,666	6,010,682	1,760,389	4,344,290	2.21	61.00	7.32	4.56	12.52

costs of dams, reservoirs, and other works regulating water supply. A low operating ratio must thus necessarily accompany a high capital ratio in order to make room for the larger fixed charges on capital investment. In the case of the Power Bureau the deviation from normal is accounted for by the fact that the plant and equipment account carried only that part of the cost of the aqueduct incurred for the purpose of utilizing the available power. This section of the aqueduct was constructed by the Power Bureau and the Water Bureau was charged while the Power Bureau was credited with an amount of \$795,000, estimated as necessary if the aqueduct had been constructed without considering power requirements. Another factor must also be considered in this connection. Since the taking over of the Edison Company's distributing system, the bulk of the power requirements have come from the Edison Company. Hence, this Company's accounts are carrying the requisite investment in hydro-electric

plant and whatever steam stand-by equipment may be necessary. The returns on this property are included in the costs of purchased power which appear in the operating expenses of the Power Bureau.

Little need be said by way of interpretation of the various series of ratios shown in the table since they speak for themselves. It may be queried whether the city equity ought not to include also the average balance in the depreciation reserve which would have the effect of reducing somewhat the rate of return on city equity, particularly in recent years, when the reinvested depreciation reserve constituted an appreciable part of the utility's financial structure. Certainly, from the point of view of profitability, the Power Bureau can be brought into a challenging comparison with similar units of private industry. Such comparisons, both favorable and unfavorable, have not been wanting. Their economic merits will be reviewed in the final installment of this series.

The Amenities in City Planning

By HERBERT S. SWAN

WE are all too prone to forget that an attractive city is something more than buildings and streets. There is a vague something—call it atmosphere, tone, character—to a community that stamps it with an individuality which is of the utmost importance to its general desirability as a place of business and residence. The attractiveness and charm of a city are to a large degree conditioned by the refinement and perfection accorded the various details of its plan. If little attention is paid to the design and composition of its minor features, the finished plan of a city will appear raw and crude. Indeed, an otherwise excellent plan may be quite spoiled by its general neglect of the amenities in city planning.

The general concept dominating the composition of a plan, the arrangement and coordination of its major elements, the detailed design of its various features—in brief, the practical adaptation of the component parts of the plan to the numerous needs of the community—have been more generally neglected than observed in the development of cities. We have been scarcely less indifferent to the preservation of those natural features which add beauty to our surroundings. Here and there, it is true, we have turned our attention to prohibiting things which obviously mar the appearance of a community, such as curbstone pumps, ghoul-like telephone and light poles, sidewalk stands, screaming billboards, and bawling signs, but even where our efforts in these respects have met with the greatest reward, much still remains to be done. Nevertheless,

we can perceive a dawning appreciation of the aesthetic among our cities. Let us hope that this appreciation may develop still further, that it will not content itself with merely eliminating ugliness in development, but that it will assert itself in a more positive manner and insist upon real heed being paid to bringing out those things relating to the potential amenity and beauty of a city.

The merchants on some streets may wonder why they fail to attract more business. But what have they done to attract shoppers? Have they installed a modern system of street lighting? Have they introduced up-to-date store-fronts? Do they permit loading and unloading of goods over sidewalks so that the walks are practically impassable? Are the sidewalks themselves safe passageways, or are they filled with such pitfalls as cellar entrances, coal holes, low awnings, steps, bicycle racks, show cases, and stands?

The active cooperation of the owners themselves is required to secure an attractive development of the community. Where owners lose sight of their reciprocal interests in the use of property, the appearance of the city is soon scarred with the marks of thoughtless and selfish individualism. Let subdivision control, zoning, building codes go as far as they will, there still remains a large field for private endeavor in the development of cities that law cannot and should not invade. A certain sphere of private initiative will always remain sacred to the citizen and yet the manner in which he uses this liberty will always have a tremendous bearing on how congenial a

place his city will be for residence and business. In some cities this sphere will be more limited than in others, but as a rule, the owner will have to settle for himself such problems as the architecture of his house, the landscape design of his grounds, and the general maintenance and care accorded his property. What amenity a community may possess will, therefore, depend to a considerable degree upon the property owner himself.

Variety in Architectural Design

The chief pride of such cities as Charleston, South Carolina, Annapolis, Maryland, Williamsburg, Virginia, Dover, Delaware, Guilford, Connecticut, Kingston, New York, and Newburyport, Massachusetts, is their early American architecture. Many of the homes in these cities have served as models of architectural design for homes all over the country. Although much of our recent residential building is of superior design as compared with that of several decades ago, it is regrettable that so many of our new homes still fail to achieve a high architectural standard.

Nothing affects the character of a residence community more than its domestic architecture. Many a suburb otherwise attractive has been practically spoiled by speculative builders who have put up rows on rows of houses of the same identical design. Although standardized construction on a wholesale scale may result in various economies in building, unlimited duplication of the same design, even though the design itself may be a satisfactory one, results in a dreary monotony which blights what might with a more varied design be an exceedingly interesting and pleasing development. A certain amount of variation in the houses on a street is indispensable to the development of a satisfactory neighborhood. A row of houses

all identically alike, or nearly so, lowers the character of the whole locality. No matter how well the streets may be planted, nor how attractively the grounds around the houses may be designed, a suburb improved with long rows of houses as much alike as peas in a pod suffers from lower land values as well as a drabber tone than one with its houses more varied in appearance and treatment. The rows and rows of houses in some of our older cities, all exactly alike, should serve as sufficient warning to the builders and developers in new neighborhoods against monotonous design. Builders who own but a single set of plans as their chief stock in trade can soon saturate the brightest neighborhood with an unshakable gloom. That we may utilize all the economies of standardized construction in the mass production of houses and yet enjoy all the advantages of varied and pleasing architectural design is something which we still have to learn in the development of our cities.

Architectural design is a matter that under our system of jurisprudence has permitted of no legal control or direction by the community. The only power a municipality has over the control of building resides in the police power, which can be used only for the purpose of promoting the public health, safety, morals, and general welfare. Aesthetic considerations may not enter as controlling factors into our public supervision and regulation of buildings. Any attempt, therefore, to improve the appearance of a community design must be done largely through an appeal to the builder himself.

In some communities the establishment of a prize awarded to the architect and owner of the building constructed during the year, adjudged by a jury to be of the best design, has done much to stimulate the construction of superior

buildings. Where such prizes have been established, a friendly rivalry has resulted between builders and architects in designing better and more attractive structures, which has been of inestimable value in improving the character of the whole community. It is not the amount of the prize itself that is of so much consideration, as it is the distinction and honor and advertisement of having put up the best building that prompts the builder to give increased consideration to the appearance and design of his structure. Who knows what effect the employment of such prizes, if generally established, may have upon our future architecture?

Art Commissions

Particularly desirable is it that our civic art should be of a high standard. The design and location of memorials and statues, even if given to a city, should have the benefit of artistic criticism. The criticism and approval of an art commission should be necessary to the erection of any structure in which the city is interested and which is of possible artistic value, such as, public buildings, bridges, subways, monuments, statues, or street lighting fixtures.

Art commissions have done much to improve the public art in many cities. In the City of New York a Municipal Art Commission with broad powers has been quietly but constructively at work for years. It saves the City from a multitude of cheap, ill-conceived monuments and ugly structures. It points out deficiencies, suggests improvements, and sometimes selects a better location. The Commission sets a high but attainable standard for the civic art and public architecture of the City, so that the greatest pains are taken in the design and appearance of subjects presented to it for approval. To set up artistic stand-

ards has not meant additional cost of construction, but it has meant the reduction or casting off of superfluous and ill-conceived ornamentation.

An art commission may prove impracticable in a very small city. In such instances the functions of an art commission may be intrusted to the planning commission which should, of course, act only after securing proper expert advice.

An art commission might well have its functions extended so as to enable it to pass upon the plans of private buildings. Even now in some states an art commission may offer advice, which may or may not be accepted, to individuals engaged in enterprises affecting the public interest. But why should we not go one step farther and recognize that all buildings affect the public appearance of a city? In doing this we may accord to every individual the privilege of seeking the advice of the art commission before proceeding with his building. He might or might not follow the commission's advice, but there can be no doubt that sound, constructive criticism along these lines would soon make itself felt in the general appearance of a city.

Street and House Plantings

Many communities have found that the organization of a garden club, which interests its members especially in the cultivation of flowers, shrubs, and trees is of considerable value in stimulating the development of an attractive community. Such an organization incites house owners to friendly rivalry in the improvement of their property in a superior manner.

A popular slogan among nurserymen is that a house is not a home until it is planted. The truth contained in this saying can readily be determined by comparing any new street only recently graded and improved with houses, but

devoid of all trees, shrubs, and flowers, with a block that has been built for a sufficiently long time to permit of the development of attractive plantings. There is always a tremendous difference between the two—one dreary and bleak because barren of all vegetation; the other, rich in attractive foliage and color, with the finished appearance that comes from beautiful plantings. These matters are likely to be neglected where it is nobody's business to stimulate interest in them. Although many owners will do everything possible to enhance the appearance of their own grounds, the lack of proper team play among numerous home owners in a district makes the ultimate neighborhood result unsatisfactory and inharmonious. May not each community profit from the experience of other communities by starting an organization which will have as its chief functions the distribution of information relative to different plants and shrubs suited to its climate and soil and the encouragement of proper planting of grounds?

Second only in importance to the design and execution of a dwelling is the treatment of its site. A suburban community may be well provided with parks, boulevards, schools, and various other public utilities, but the most vivid impression retained by the visitor is the general type of the residential development. And the most pleasing effect is obtained, not by the house itself, but by the combined effect of the house and grounds. A street may be improved with houses designed by the best architectural talent but, unless these are properly supported by plantings, the general effect is raw and indifferent. On the other hand, a very commonplace housing development can be made attractive if good taste and care are employed in developing the area around the house.

Large portions of our suburbs will undoubtedly be developed the next few years by speculative builders whose primary interest will be to dispose of houses as rapidly as they can be built. These houses will be advertised as being "beautifully landscaped," which very often means that a few exotic plants have been indiscriminately placed in the front yard, without any relation either to the house or to neighboring houses. Scarcely is thought given to the natural character of the plants used. In the north, it is not unusual to find such trees as young white pines, spruces, and firs used for base plantings around the house. If they live, such types cannot be restrained in growth; in a few years they grow so tall in their fight for life and light as to obstruct windows and doors, shutting out light and air. Plantings of this kind will increase if the general public is not educated through garden clubs and other agencies.

Since the services of a professional landscape architect are beyond the means of the average small house owner, a few general principles can be outlined to aid in obtaining better planting effects around the small house. In the first place, the plant materials which are used in creating an artistic setting for the house can roughly be divided into four groups: grass, trees, shrubs, and flowers, of which the first three are the most important for a permanent all-year-round effect. These elements when discriminately chosen and arranged with nicety and refinement make for an attractiveness and character obtainable by no other means. They constitute the frame into which the building is set.

The main purpose of landscaping the grounds around a dwelling is to enhance the appearance of the building. The plantings must be contributory to the general effect; they are not an end in

themselves. If the best effect is to be secured, most of the plant materials should be of varieties harmonious in both tone and color; the habit of growth should be horizontal rather than vertical. Only by means of such material can well-rounded silhouettes be achieved. Vertical plant materials or plants of striking color should be sparingly used, but they have a place where emphasis or accent is desired, as, for instance, around the doors and corners of the house.

In the absence of more good examples, much of the planting around smaller houses, as well as some of the more pretentious dwellings, is done in imitation of bad precedents. The owner has a special preference for a few showy nursery specimens. Naturally, when such plants are used around the house, the result is spotty and unrestful from the beginning. Even age does not improve the general effect. The individual plants compete with each other and with the building; the results are invariably unsatisfactory.

An attractive front yard does not necessitate the expenditure of large sums of money. As a matter of fact, if a little patience is exercised and the owner is willing to wait a few years for the ultimate appearance, good effects can be obtained from a small initial expenditure. Nor is it necessary to use a large variety of plants. The best results are often obtained by using only a few species. But it is necessary that the plants be arranged with discrimination.

That we are making real progress in recognizing the importance of proper landscape design in the community is suggested by the increasing number of homes that are each year having their grounds planted. Even commercial and industrial establishments are beginning to have their grounds landscaped. The Doubleday plant in Garden City, the

Condé Nast plant in Greenwich, various insurance companies in Hartford and Baltimore, and numerous factories in Syracuse and Rochester all have had their grounds attractively developed.

As a rule, not nearly enough thought has been paid to our house and street plantings. Yet these lend as much distinction to the general appearance of a community as any major feature of its plan. To the average person, the local flora as much as any other one element are what distinguishes a Florida winter from a Long Island summer. Who, for instance, can ever dissociate such cities as Fort Myers and Palm Beach from the royal palm, the cocoanut palm, or the royal poinciana? And how can he who has passed a Christmas in San Diego ever forget the glorious poinsettia that lends such charm and warmth to its balmy winter?

The north, too, has its distinctive trees. What New England village, for instance, is not proud of its fine old elms? These trees are inheritances from the distant past. Today they stand as living monuments to the farsightedness and public spirit of men long dead.

In most cities it should be possible to line every residence street with trees. Care should be taken, of course, in laying out the scheme of planting to plant only one species in any given block; different species within a block usually detract from the dignity of a street. Indeed, better results are obtainable if each particular street is confined throughout its length to a given species. By exercising proper discrimination in selecting the species of trees planted in its streets, a city may capitalize its local flora to its great advantage. It can also endow itself with a new personality, as appropriate trees give a large measure of distinction and character even to an otherwise undistinguished community.

Vistas

Probably few people in our large cities would recognize pictures of their most prominent buildings, for the simple reason that they have never had a proper view of the buildings. Built on a rigid gridiron plan, surrounded on all sides by buildings of overwhelming height, the modern office skyscraper, like the high tenement, is usually pocketed in a dark canyon, known and identified solely by its street number. In New York this is true even of the most monumental buildings, such as the Pennsylvania Station, the Federal Reserve Bank, the Public Library, St. Patrick's Cathedral, and the Stock Exchange.

The street plans of most American cities afford few satisfactory settings for either private or public buildings of importance. They afford no vistas, no approaches, no vantage points from which buildings can be seen once they have been erected. The result is that many of our most costly buildings have been constructed in the most matter-of-fact way, with little or no thought of their architectural value, sole consideration being given to the maximum possible cubage. On the other hand, many notable buildings from an architectural point of view have been so thoroughly hidden away in an endless facade of high buildings that they have never really been seen by the public. This situation is as true of New York as it is of Philadelphia; of Pittsburgh as it is of Los Angeles.

The universal monotony of our rigid checkerboard street plan has cost us so great a toll in architectural values that we all but scream with joy when we find an occasional street that focuses on a beautiful facade, as we sometimes do in Boston, Buffalo, Cleveland, and Detroit. The radial street plan of Washington was, of course, designed in part to afford

satisfactory settings for the more important public buildings. There the collaboration between city planner and architect, as evidenced by the approaches to the National Capitol and to the union station, is well nigh perfect.

The primary purpose of a thoroughfare plan is, of course, to serve traffic. But its utility need not be impaired because it articulates with the requirements of a satisfactory building plan. European cities have more generally recognized this fact than have our American cities. There, most streets are usually short; the few long streets have frequent bends. In either case they provide vistas for prominent buildings. But where the street plan has not lent itself thus, a plaza has been introduced, in many instances, to provide a more satisfactory setting for such buildings as the cathedral and the town hall. The plaza as thus used in European cities is almost unknown in this country.

Plottage

We have usually considered plottage as entirely a private matter; both the size and the arrangement of the lot have been left to the individual owner. Yet both affect the appearance of a city. Take Pennsylvania Avenue in Washington, for example; there, many of the lots, especially corner lots, are not only small, but either triangular or trapezoidal in shape. The result is that the corner lots are improved with small, low buildings and the interior lots with large, high buildings. A similar condition exists on Fairmont Parkway Extension in Philadelphia. Harmony in appearance and development, at best a difficult achievement in the case of downtown buildings, is made practically impossible by such a ground plan. In Paris, harmonious development has been promoted in such cases as these by completely forgetting

the individual lot and developing the whole block with a uniform height of building.

Boston, years ago, attempted to control some of the worst abuses resulting from the tall building on the narrow lot by restricting the height of buildings over 80 feet high to a limit not more than twice the width of the lot occupied on each street by the building. In permitting higher buildings on the wider frontages, this provision placed a premium on plottage. The appearance of most business streets would be appreciably enhanced by some such limitation upon the too narrow lot.

Most of the crudeness in the appearance of our business streets is attributable to the too narrow lot. A lot 20 or 25 feet wide simply cannot be improved with a building of either satisfactory utility or appearance, especially when the building is 12, 15, 20 stories high. Outwardly, because its height is out of all proportion to its breadth, such a sliver presents an ungainly and top-heavy facade; inwardly, because of its cramped width and dingy court, its rooms are likely to be both pinched and inadequately lighted.

In some cities, such as Camden, for instance, lots have been laid out as narrow as 12 and 13 feet in the residence districts. Such lots are, of course, so small that they cannot be improved singly with sufficient open space about the buildings. Such lots place a premium upon the construction of long, narrow row houses, obtaining their light and air solely from either end of the house, with a series of dark, unhealthy rooms in between. As the community is limited in prescribing adequate court and yard provisions by the prevailing size of lots, the most effective way to secure wholesome building conditions is to anticipate the building regulations at

the time the lot is laid out, and give the lot sufficient size to admit of the erection of well lighted and well ventilated buildings.

Hillsides

Most developers view a hilly terrain as more or less of a liability to their operations. No doubt, an uneven tract requires considerably more thought and consideration for proper development than a flat table land. At the same time, a hill, if viewed in the proper light, instead of being a liability can be made a real asset. In order to be so, however, it must be properly treated.

Here, let us say, is a tract of land; the variety of its topography, its brooks, its high rocks and cliffs, as well as its native vegetation, all combine to vest it with possibilities that are almost unexcelled for a delightful residential development. Why has the subdivider usually failed to capitalize these advantages in a satisfactory manner? Because he has neither been alive to the inherent values in the land nor possessed the sympathetic understanding so necessary to the appropriate development of the area.

In practically every instance a hill is a challenge to the ingenuity of the subdivider, if he is to benefit by the potential characteristics of the site. Here most developers fail in their task, because, instead of appreciating the unique value of a hill, as has been done in Palos Verdes, California, they insist upon treating it as if it were no different from a meadow.

Waterfronts

Few waterfront cities have paid more attention to the planning of their water areas than Stockholm. No one visiting the Swedish capital is in doubt for a single instant that he is really in a sea-side city; no matter which way he looks,

he sees the Baltic. The water areas are recognized as integral parts of the plan; they have, indeed, been given almost as much weight in the plan as the land areas themselves. The same is true, though in a different way, in such cities as Geneva, Lucerne, and Montreux. In contrast, our American cities, judging by their plans, have quite generally acted as if they were ashamed of their water areas; so many of our cities have deliberately turned their backs to the water. What should be one of the most attractive features of many communities has been accorded a wholly subordinate place in the plan.

Even where we have recognized the claims of a waterfront in a city plan, we have never admitted, as have Budapest, Geneva, Paris, Stockholm, and Vienna, that a commercial utilization of the shore can go hand in hand with its enjoyment as a place of recreation. We have still to learn from European cities that the same stretch of waterfront may be used for both purposes without injury to either use. Probably in no phase of city planning have we been or are we still more lacking, in comparison with European cities, than in the treatment of our water areas.

Preservation of Historical Landmarks

A considerable amount of public interest is always attached to an old fortification. The Castle at Edinburgh, for instance, casts a spell of enchantment over the whole city. The same is true to a less degree of the old Spanish fort at St. Augustine and of the old fortifications at Quebec; both attract thousands of visitors annually. Old lighthouses, too, possess a certain fascination for most people; those at New London, Stonington, and Point Loma, San Diego, are among the chief centers of interest in their respective communities.

The preservation of a historical or literary monument reflects the glory and honor of the past upon the present. Witness, for example, Mount Vernon, Monticello, the Adams Mansion at Quincy, the Lincoln Memorial at Springfield, Longfellow's birthplace at Portland, or the House of Seven Gables at Salem. Not to have preserved them would have the appearance of sacrilege. To protect and cherish these treasures of the past develops the civic pride of the community. At the same time, it secures the affection and good will of strangers which could be obtained in no other way.

Social Centers

Nearly every new urban community suffers from a certain bleakness and drabness in its social life. People who acquire homes in a new subdivision have few or no community attachments. The lack of these attachments seriously retards the development of many an attractive suburb. If this need for social intercourse could be filled in a proper manner, it would go far toward stimulating an earlier development of the community along superior lines. One of the greatest needs in this respect is a community meeting place where people can get together for meetings, lectures, concerts, dances, and various other forms of entertainment. In a built-up community these requirements are usually met through the organization of private clubs with their own club house, but in a new community such clubs are, for obvious reasons, impracticable during the initial period of development. Here, however, the public school can serve a most useful purpose. The public school, if equipped with a proper auditorium, can supply in nearly every community a desirable forum for its many neighborhood activities. Any community with a

properly appointed school, even though it be a new community, need not feel that it is devoid of those human exchanges which are essential to the social well-being of its members.

Zoning

Zoning regulations will, of course, protect residence districts from becoming spotted with all kinds of out-of-place buildings. These regulations not only exclude all kinds of business and industry from residence zones, but they also control the height and bulk of buildings. Such provisions go a long way toward controlling the character of a residential environment. Yet many people will probably wish to go much farther in controlling their development. Zoning does not, for instance, establish the minimum cost of houses, the architectural design of buildings, or many other intimate matters which, if properly controlled, decidedly promote the attractiveness of a city.

There are some things that zoning cannot do. A zoning ordinance may not legally enter into considerations of an aesthetic character, and yet such considerations are, of course, very germane to the best interests of the community. Such things can be controlled only through restrictive covenants running with the land. Some people may have thought that the adoption of a zoning ordinance would obviate the necessity for such covenants. This is, however, not at all so. A sphere will always remain for restrictive covenants in a high class residential development to control things outside the scope of a zoning program. If shacks are to be prevented in residential districts, there will be as much need as ever for requiring buildings of a minimum cost to be erected in different districts. The same applies to matters relating to architec-

tural design. All sections of the community will not wish to have the same covenants, but certainly areas which are intended to attract the highest grade buildings will need stringent covenants. This is, however, not a matter for the community itself to undertake officially; if it is to be done at all, it must be through contractual relations entered into between developer and prospective home builder.

Why many towns are humdrum places, lacking charm, devoid of interest, being merely dreary wastes of brick and mortar is the result of their neglect, one might almost say, scorn, of those amenities which alone endow an urban community with the quiet and warmth of an inviting environment.

Design of a City Plan

In developing its plan, a city should study and, if possible, accentuate those things which it has received either through inheritance or through nature and which differentiate it from other communities. Such points of difference, if properly taken advantage of, afford strength and interesting originality to a plan.

If the points of difference are the points of excellence in a plan, then these, if properly understood and sympathetically employed in its composition, will give a city individual character. So numerous are these points of difference, relating as they do to the climate, location, topography, environment, historical origin, and the objective purposes of the community that were they properly studied and interpreted in city building, there need be scarcely two cities alike. To the degree that this idea controls the development of a city, it may be said to have an ideal plan; to the degree that it does not control, the plan leaves that much to be desired.

The plan of a community is the result of many different factors. Hills, mountains, swamps, valleys, rivers, lakes, and inlets of the sea are physical features that cannot, of course, be ignored. But what the plan is or what the plan is not is mostly a matter of design, or a lack of design, on the part of those who plan a city. Seldom are topographic conditions so uncomprising as to force a predetermined plan upon a community. Important as natural features may be, they nevertheless are not so arbitrary as to compel the acceptance of any particular design. The particular design of a community is almost always more a matter of plan or of accident on the part of the developers of the community than it is of a combination of peculiar conditions in the site itself.

Optimum Standards in Planning

We hear much about minimum standards, but little about optimum standards in city planning. Yet how contrary this is to all rational planning! Just as if the wants of human beings can be classified and tagged as so many inanimate objects, irrespective of climate, latitude, or altitude!

Our zoning ordinances generally provide that buildings shall not exceed such and such a height. But where is the zoning ordinance or the thoroughfare plan that takes the slightest recognition of the movement of the sun through the heavens or the amount of sunshine essential to health? Our courts and yards must be so and so wide, but where is the building regulation that relates these requirements to the general well-being of persons in offices or apartments? Some cities, because of cloudiness, fog, and rain enjoy less than half as many sunshine hours per year as other cities. But where does one find a recognition of this fact in their respective city plans?

In controlling traffic, the standard of thoroughfare use is expressed in terms of the number of vehicles per traffic lane per hour; in mass subway transportation the standard is stated in terms of so many passengers per car-mile per hour; in playground use the standard is in terms of so many square feet of playground space per playing child. Every one of these standards represents the maximum capacity of the particular facility. In no case does the standard concern itself with the most enjoyable, the most comfortable, or the most convenient use of the facility. An optimum standard is, on the other hand, not so much a mathematical figure as a fixed measure of service. Is it not about time that we pay some thought to the development of such standards in the planning of our cities?

To build the most livable city, the city with the greatest beauty and the greatest convenience, requires the active collaboration of all the brains and ability in a community. The wonderful cathedrals that have come down to us from the Middle Ages represent a mobilization of all the technical and artistic ability of the time; architect and engineer, sculptor and painter, silversmith and glazier, wood-carver and stone-cutter—all out-did themselves in producing the best there was in them in order to hand down to posterity a monument embodying the highest ideals of their civilization. What a loss it would be to the world today if in building Chartres, Cologne, or York they had conceived of their task in terms of a minimum standard!

City planning may be, as somebody has said, the technic of sociology applied to the social organization of an urban area. But it is also something more. A city plan provides the constructive imagination, the inspiring ideal that infuses

meaning into the growth of a community. A city plan, in a word, is the measure of applied idealism in a community; it represents the devotion and loyalty that the citizen bears his city; it suggests as nothing else the degree to which the citizen has dedicated himself to the cause of unselfish service both to his generation and to posterity.

Proportion, scale, balance must be considered in the design of a community. What a city does or does not do affects the life, hopes, and aspirations as well as the health, comfort, and convenience of every inhabitant. Until recently we emphasized the economic interest, al-

most to the exclusion of every other interest in the development of a city. Now, however, we are gradually perceiving that man does not live by bread alone. Important as his economic interests are, he still has other interests and they, too, are entitled to their just claim. The intellectual, artistic, and spiritual needs of his being, instead of being ignored, should also receive proper recognition in the plan of the community. This is, in a word, what amenity in city development means. We at least know that a city plan in effect expresses the progress and civilization attained by a community.

An Analysis of the Uniform Rate Area As a Territorial Rate Policy

By WALTER E. CAINE

ALTHOUGH the practice of averaging generation and distribution costs in order to supply current to several communities at a uniform price was adopted in California as early as 1914 with the Antioch case,¹ the policy neither deserved nor received much attention at that time. Shortly thereafter, however, the changing character of generating and distributing electricity began to gather momentum, until eventually the typical plant could no longer be described as isolated and sufficient unto itself. Municipal "Monroe Doctrines" were swept aside and hundreds of communities throughout the country launched on careers involving "foreign entanglements" (of copper wire, in this instance) with other communities in their state. Local plants were scrapped, high voltage transmission lines took their place, and not until the smoke began to clear in 1930 could the results of the movement be plainly observed. Toward the end of the decade, the public, the utilities, and the regulatory commissions in various parts of the country were brought to a more complete realization that the rapid integration movement of the preceding 10 years could not have been accomplished without undermining, to a certain degree, established rate-making procedure.²

¹ *Town of Antioch v. Pacific Gas & Electric Co.*, California Railroad Commission Decisions, vol. 5, Decision No. 1655, Case No. 400.

² This statement must not be interpreted to mean that no recognition was given to "territorial" rates before the year 1930; the problem was touched upon in a number of cases even during the decade 1910-1920, while the case of *City of Eau Claire v. Railroad Commission of Wisconsin* (178 Wis. 207; P. U. R. 1922 D 666)

Many operating companies found themselves serving two or three hundred communities spread over a considerable area, each being served at rates resulting from individual rate litigations initiated before consolidation. As long as each town was served by its own company, the price of electricity to consumers in the next town was of comparatively little consequence, but as soon as the integration movement began to gain momentum, consumers found they had a talking point. For now, with the same company serving many communities, consumers could no longer see justice in any difference in price for the same class of service as between towns, and a new public relations problem began its development.

More than ever before, the rate schedule is now seen to involve a joint problem; as the connecting link between the company and the public, it can no longer be underestimated from the standpoint of public relations, aside from the very obvious fact that upon it depend the revenues of the company. In other words, in setting a rate which will provide a reasonable return upon the investment, the particular policy decided upon must be carefully examined in the light of its effect upon public opinion.³ As a result of the

decided in 1922 was of major importance at the time. But it is safe to say, that the problems of "territorial" rate-making were not given the consideration due them until the end of the past decade, previous references to them being for the most part only incidental to other questions.

³ This is true even overlooking the question of unfair discrimination. Two rate schedules of equal justice to consumers would be very likely to produce entirely

(Footnote 3 continued on page 149)

integration movement this problem assumes territorial rather than strictly local importance.

Some utility executives have ignored the territorial aspects of the rate schedule entirely. Others have recognized it and reacted to it by intensifying the strict cost-of-service principle. A great number of the larger companies, however, have gone to the opposite extreme and initiated some degree of uniformity, regardless of cost conditions, *chiefly as a public relations policy*, although certain other advantages of administrative convenience, economy, and efficiency are likely to follow such a move.

Uniform Rate Area Defined

Since the term "uniform rate area" has been repeatedly used to designate the territory of any company employing any degree of uniformity in its rate schedule, the meaning of the term must be clearly understood at the outset. But this proves to be no simple task. Every writer on the subject has apparently adopted some sort of definition of the term for his own satisfaction, but few have made any attempt to pass the definition on to the reader.

In an article entitled, "A Classification of Uniform Rate Areas for the Electric Light and Power Industry,"⁴ the writer attempted a definition and found it practically impossible to formulate a single statement which would not exclude some important cases. Obviously, a uniform rate area is any part of a utility's territory in which all customers of the same class are served at identical rates. If this were to be the definition, most cities would be included, but since the principle of uniform rates within cor-

porate boundaries has become firmly, if not universally, established, such cases may well be omitted from further discussion. Likewise, if two or more communities are directly contiguous, such an area may be looked upon as a single community and passed over, in spite of the fact that it is divided for political purposes.

With these two possibilities eliminated, the concept may be broken down into (1) the *strict* and (2) the *conditional* uniform rate areas. These may be defined as follows:

1. A *strict* uniform rate area contains two or more non-contiguous communities in which all classes of customers are served at like rates—both in form and amount—within classes.
2. A *conditional* uniform rate area is considerably more inclusive, comprising five general types:
 - A. Uniform rates for like classes of service within groups of communities, the grouping being based upon population, location, et cetera. That is, rates are uniform within groups of communities, but a difference in price and possibly in form exists between the groups.
 - B. Uniform rates for like classes of service within groups of communities, as above, but with one or more classes of customers being served at varying rates.
 - C. Uniform rates for like classes of service in one or more groups of communities, as above, but with some communities being served at special rates for all classes.
 - D. Uniform rates for like classes of service over the entire area served, but with one or more classes of service excluded from the policy.
 - E. Uniform rates for like classes of service for only a part of the utility's territory and for only a part of the classes of service.⁵

considerable extent in its choice of a territorial rate policy.

⁴ *Journal of Land & Public Utility Economics* 328-332 (August, 1931).

⁵ Classification "B" did not appear in the original (Footnote 5 continued on page 150)

(Footnote 3 continued from page 148)

different reactions. Consequently, the difficulty is not alone to construct a non-discriminatory rate schedule, but to construct a non-discriminatory rate schedule which most consumers will approve. This is an important consideration which must influence the utility to a

These conditional types of uniformity present many of the problems encountered in the operation of the strict uniform rate area. They are uniform rate areas only to a lesser degree than the strict, and in many cases are undoubtedly a transitional step toward the final goal of uniformity for all classes throughout the whole territory. Since this is the case, they are important, in a secondary sense, in the light of both their existence and their potentialities.

This attempted definition gives some indication of the complexity of the uniform-rate-area concept, while Table I shows that the differences outlined above are not entirely theoretical but are based on actual practice in the industry. The list is not exhaustive but it may be of interest, particularly to the rate engineer, because of the light it sheds on the extent and status of this policy in current rate-making practice.

Some Advantages of the Uniform Rate Area

Most companies, whose rate schedules exhibit some conditional type of rate uniformity, freely admit that the ultimate goal is the *strict* uniform rate area. And, if commissions continue to look upon the policy with favor, many advantages will undoubtedly accrue from such a course of action.

Certain advantages resulting from a strict uniform rate policy are evident with little reflection and are generally recognized by utility executives who employ the policy. These are general administrative advantages which include: (1) cheaper billing, (2) greater efficiency in accounting, (3) ability to shift personnel more easily among various districts, (4) more effective centralization of control, and (5) removal of

TABLE I. COMPANIES EMPLOYING UNIFORM RATES*

Company	Degree of Uniformity	Number of Communities	Population Served	Commission Approval†
Detroit Edison.....	Strict	202	2,279,000	Informal
Edison of Boston.....	Strict	40	1,318,000	Formal
Duquesne Light.....	Strict	132	1,407,000	Informal
Public Service Elec. & Gas.....	Strict	221	3,191,500	Formal
Public Service of N. Illinois.....	Strict	316	1,100,000	Informal
San Joaquin Light & Power.....	Strict	173	302,700	Informal
Oklahoma Gas & Electric	B & D	50‡	610,000	Informal
Connecticut Power Co.	B & D	14	90,900	Informal
Alabama Power.....	A	450	600,000	Formal¶
Nebraska Power.....	A	52	510,000	Informal
Northern States Power (Minn.).....	A	326	1,234,000	Informal
Southern California Edison.....	A	360	3,000,000	Formal
Wisconsin Public Service	A	109	340,000	Formal
Illinois Power & Light...	C	.....	.....	Informal
Central Vermont Pub. Service.....	D	99	108,000	Formal
Georgia Power.....	D	413	2,350,000	Formal
Metropolitan Edison.....	D	73	410,000	Informal
Monongahela W. Penn. Pub. Service.....	D	330	670,000	Informal
Pub. Serv. of New Hampshire.....	D	102	214,700	Formal
Central Illinois Pub. Service.....	E	461	550,000	Informal

*Obviously, this is only a partial list of companies employing uniform rates of one kind or another. The author has corresponded with officials of the companies listed in the table, however, and feels that a fairly accurate picture of their rate policies was obtained. The data are as of 1931.

†All communities are contiguous in this case.

‡Communities under 1,000 population are not given.

§ By "approval" is meant either a rate case in which the principle of some type of uniformity was upheld or a case in which the commission definitely forced the company to initiate some type of uniformity.

¶ Company started to unify rates in 1915; Commission speeded up the process in 1929.

those differences in rate levels between communities which cause much dissatisfaction and many rate inquiries.

These factors require little discussion. To the extent that they result in lower operating costs, which in turn result in lower rates, they are factors tending to make the uniform rate policy desirable from the standpoint of the consuming public. To the extent that they result in greater efficiency of management, they make the policy desirable to the utility. Other advantages, however, warrant separate mention.

Avoidance of Public Disapproval. The strict uniform rate policy, for example, eliminates public disapproval which

(Footnote 5 continued from page 149)

article on this subject, cited above. A fuller description of these classifications may be found in that article.

commonly arises when rate zones are established on the basis of distance from the load center or source of supply.

Simplification of Rate Making. Again, such a policy, it is claimed, will "very much simplify rate making."⁶ This is open to question, however. A considerable study would be necessary in order to establish the fact that, in general, less trouble and expense are required to set a uniform, just, and cost-covering rate for an entire territory than to set individual rates for each community in that territory. If the individual localities present widely varying costs, a great deal of work is likely to be involved in deciding upon the standard rate, and a great deal of time spent in justifying that rate to the different localities after it has gone into effect. The statement, as quoted, is apparently based upon the assumption that only differences in rates will cause public agitation. It is also possible and entirely probable that, as the consuming public becomes better acquainted with the bases of rate-making, *differences in costs under uniform rates* will cause comment and trouble.⁷

Yet it cannot be denied that in some operating systems, so complicated that an accurate cost allocation is almost impossible, a uniform rate on an average cost basis may greatly simplify the process. An excellent illustration of one company's reasoning under such conditions is found in the testimony of the Wisconsin Power and Light Company in February, 1928, at a hearing before the Wisconsin Legislative Interim Committee on Water Power. The Company

supplied at retail approximately 200 communities, ranging in population from 50 to 37,000, over an area of about 10,000 square miles. These communities were all interconnected by an extensive transmission system, which was in turn fed by several generating plants. These sources of power (as of 1928) were: (1) two hydro-electric plants on the Wisconsin River at Kilbourn and Prairie du Sac, (2) about 20 small hydro-electric plants scattered over the entire area, (3) a steam plant located at Sheboygan where coal could be delivered by lake transport, (4) a steam plant at Beloit near the State line and Illinois coal fields, and (5) several small steam plants as well as interconnections with neighboring systems.

The testimony explained that "the principle sources of power are from plants located near the outside boundaries of the territory served . . . This is highly desirable because it permits the supplying of energy to practically every community from two or more sources of supply and over two or more separate transmission lines." But from this highly desirable situation the greatest problems of cost allocation arise, and the Company was eventually induced to recommend an averaging of costs. An intelligent combination of steam and hydro generating units as employed in this system is in itself highly desirable, for by means of numerous interconnections the steam generation may be increased to supplement hydro generation during periods of poor water conditions.⁸ This also would tend to result in frequent

⁶ See Frank G. Baum, "Uniform Class Rates for Power Systems and Territories," Report of the Rate Research Committee, Appendix A, p. 8, *National Electric Light Association Proceedings*, 1923.

⁷ For example, the Mayor of Detroit at one time initiated an investigation of the cost of service in that City in an attempt to obtain lower rates for Detroit

consumers than were in effect in the surrounding communities and rural territories, the whole area being served at uniform rates at that time.

⁸ This supplementary character of steam and water as prime movers may be strikingly illustrated for the State of Wisconsin by charting United States Geological Survey figures for monthly production by each method.

shifting of the source of current for any particular locality.

The results of such a set-up are well illustrated by the following quotation from the Company's testimony:

"Let us consider the conditions that might prevail in the City of Beaver Dam. During the month when good hydro-electric conditions prevail, Beaver Dam might secure all of its power from Prairie du Sac over the line from Prairie du Sac to Dane and Beaver Dam. However, for some reason or other there may be trouble on the Dane-Beaver Dam line and this service would then be supplied over the Baraboo-Portage-Fox Lake line. In some other month when the water conditions are not good, Beaver Dam could secure all of its energy from the Sheboygan steam plant over the line from Fond du Lac and Waupun. However, if there is trouble with the Fond du Lac-Waupun-Beaver Dam line, it might still receive energy from Sheboygan over the Fond du Lac-Ripon-Fox Lake line. In some months it might receive part of its energy from Prairie du Sac and part of its energy from Sheboygan and under certain conditions it might receive some energy from Beloit or some of the hydro-electric plants located in another part of the territory. This illustration shows the very complicated operation of a system such as that operated by the Wisconsin Power and Light Company and shows that conditions vary from month to month."

In view of these conditions which might be representative of almost any of the 200 communities served by the Company, it is not surprising that the Company reached the conclusion that "the cost of power at any point on the main line system should be the same." Consequently, it was recommended that the main interconnecting power lines could best be considered as extensions of the bus-bars of the individual generating plants and the system considered as a

single power supply unit. If the Ontario system⁹ were attempted under these conditions, a more or less arbitrary succession of rates would have to be evolved, changing from month to month or even from day to day, depending upon the source of power (which could not always be accurately determined) and the transmission line distance of the municipality from that particular source or sources. A complete revision of rates would also be required, in theory at least, with the installation of each additional generating unit and with the construction of each additional interconnecting line which might in any way affect a given community. Averaging of generating and transmission costs supplies a ready solution to such a difficulty.

Promotional Aspects. Still another advantage of the *strict* uniform rate area, though less easily perceived, is its potential ability to promote consumption in outlying high-cost territories. One of the greatest difficulties to be met by a large operating utility is the extension of service into areas which demand it but which cannot be supplied at a reasonable price on a basis of strictly allocated costs. Similar to this is the problem of lowering rates to a reasonable level (from the value-of-service standpoint) in high-cost areas where the rate already in effect is unusually high as a result of a strict allocation of costs. Such conditions are most commonly found in small isolated communities, communities distant from their power source, and rural areas.

Some will argue that such areas should not receive service unless its value to them is sufficient to justify their willingness

⁹ Briefly, the Ontario system is as follows: Power is delivered at the bus-bars of the generating station at a uniform price per horsepower-year of maximum demand. Transmission costs are then allocated strictly

according to distance from the plant measured in miles of transmission line and proportional to the amount of consumption. Each community pays its own substation and local distribution costs.

to pay all costs incurred in serving them. Others will argue that from a social standpoint there is no reason why such areas should not receive service at rates considered reasonable under more advantageous cost conditions.¹⁰ But in order to accomplish this, those taking service under *more* favorable circumstances must in effect subsidize those demanding it under *less* favorable circumstances.

The character of the electric industry seems to be that it manufactures its own demand, at least as far as domestic service is concerned, and this demand is cumulative. Or to paraphrase, the utility decreases its rates; consumers use more current with their existing appliances and can be more easily induced to add to those already owned; consumption increases and the *total bill* per customer finally exceeds the old total bill even though the average price per kilowatt-hour is lower; this in turn may make possible a further decrease in rates, and so on. Naturally, this cannot go on indefinitely. The consensus of opinion, however, is that it should go on to the point of maximum utilization of equipment. Unused capacity, which J. M. Clark called "that great industrial sin," provides the major factor inducing this cumulative growth and satisfaction of consumer demands.

But returning to the original discussion concerning extension of service into high-cost areas at a rate less than the actual cost of the service, the question

to be asked is, "Would results be in any way analogous if the utility were to serve this high-cost territory at the lower promotional rates in effect in the most profitable sections?" Might not the less developed areas have a sufficiently elastic demand to result in their eventually paying their own costs? It is true that the general conception of "promotional rates" has to do with the structure of the individual rate and the relative price level of various use classifications of service; the suggestion presented here might be termed a *territorial promotional rate policy*. Whether or not such a policy is economically feasible can only be determined by a survey of particular circumstances with respect to possible future use under lower than present cost-rates in the area in question.

A study of the existing and probable future density factors, for example, is necessary to fix the upper limit of additional investment to be placed in such a territory.¹¹ If the possibility is demonstrated, however, then would it not be to the advantage of the least-cost customers in effect to subsidize the customers on the new extensions or high-cost areas for a period, in view of the probability of the resulting increase in consumption conceivably sufficient to result in decreased rates over the entire system at some future time? If such a possibility is admitted, then the strict uniform rate area may be looked upon as a promotional feature, to be used to the profit of both the utility and the consumer.

¹⁰ See, for example, Governor Roosevelt's speech of August 29, 1929 at the New York State Fair at Syracuse, reported in the *New York Times*, August 30, 1929, p. 11.

¹¹ A comprehensive state-wide study of a problem such as this is not entirely inconceivable. Witness, for example, the Public Utility Corporation, soon to be appointed for Wisconsin by Governor La Follette. Among others, it will be a duty of the Corporation to make state-wide surveys of the advantages of centralized generation; steam, hydro and Diesel generation;

methods of promoting rural electrification; potential markets for domestic, commercial and industrial power, et cetera. It will be essentially an attempt to further the use of power in the State in accordance with a logical plan of development. The consumers in Wisconsin might also find it profitable if the Corporation, when appointed, were to undertake the study mentioned here in an effort to determine, within definite areas, the elasticity of the demand for electricity. The utilities in the State might in turn find it profitable to cooperate by lowering rates in sections where the demand was judged to be sufficiently elastic.

*Some Disadvantages of the Uniform
Rate Area*

The impression must not be gained from the preceding section that the author believes the adoption of the strict uniform rate policy will prove a panacea for all operating friction attributable to the rate schedule. The companies whose rate policies were classified in Table I did not reach the varying degrees of uniformity which they now exhibit without overcoming certain difficulties. Why is it that, while most of these companies have indicated their intention of putting into effect the *strict* uniform rate policy, they are still for the most part in a transitional stage?

Increases Some Bills. Probably the chief reason is that, when the shift is made, an average rate cannot be reached without raising the bills of some customers. Consequently, if the shift is made within a short space of time, the policy becomes a boomerang in its effect and stirs up public resentment, while public reaction should be, and usually is, favorable. The Georgia Power Company affords an illustration of the effect, upon consumers' bills, of a wholesale shift to rate uniformity.

In December, 1928, the Georgia Public Service Commission issued an order placing all residential customers of the Company on a uniform basis.¹² Up to that date the Company had been serving over 300 towns in the State at widely varying prices. At the time of the shift, there were 22 different rates for residential service. The non-uniformity of rates was held to be the result of the Company's gradually extending area of

service through acquisition and merger of properties. In view of the new situation—that is, an interconnected area with power flowing from many sources—the Commission felt that a uniform rate was desirable. Consequently, on a given date, all residential customers in the State were shifted to a new standard rate. Table II shows how the old differences were ironed out, by comparing for eight Georgia communities the price for a certain number of kilowatt hours under the old and new rates.

For the communities listed in the table, the chief sufferers from the new rate were those consumers taking very little service,¹³ while drastic cuts were made in the higher consumption groups. In this case the Commission set a new standard rate which did not maintain the revenue figures of the Company at the old level; in fact, it cut them about \$2,000,000 in two years.¹⁴ If a standard rate had been set at a level which would have insured the old revenue figures, increases in individual bills would have been much more in evidence or cuts in the high consumption groups would have been less drastic.

In the case of the Georgia Power Company, the Commission took the initiative for rate uniformity, and the necessary increase in some bills was permitted. In general, however, the utility initiates the policy, with the Commission standing firmly against any increases in individual bills resulting from the uniform rate.

At least two methods suggest themselves for surmounting this difficulty;

preted to mean that about 21% of the residential consumers of the Company used 15 kw. hrs. or less per month and as such had their bills increased by the new uniform rate.

¹⁴ From the testimony of Preston S. Arkwright, President of the Company, before the Georgia Public Service Commission, reported in the *United States Daily* of September 20, 1930, p. 11.

¹² P. U. R. 1929 B 156.

¹³ That this raised the rates for a good many consumers is born out by the statement of the Commission that approximately 21% of the Company's residential customers were, at the time of this case, "minimum charge" customers. Since the minimum bill included from 10 to 15 kw. hrs. of energy, this may be inter-

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TABLE II. RESULTS OF UNIFORM RATE POLICY ON CERTAIN CONSUMPTION GROUPS IN EIGHT GEORGIA COMMUNITIES*

	15 Kw. Hrs.		30 Kw. Hrs.		50 Kw. Hrs.		100 Kw. Hrs.		150 Kw. Hrs.		200 Kw. Hrs.	
	Old Rate	New Rate	Old Rate	New Rate	Old Rate	New Rate	Old Rate	New Rate	Old Rate	New Rate	Old Rate	New Rate
Atlanta.....	\$1.22	\$1.75	\$2.43	\$2.50	\$4.05	\$3.50	\$8.10	\$5.00	\$11.70	\$6.50	\$15.30	\$8.00
Augusta.....	1.35	1.75	2.70	2.50	4.50	3.50	8.75	5.00	12.75	6.50	16.75	8.00
Macon.....	1.50	1.75	3.00	2.50	5.00	3.50	8.50	5.00	11.50	6.50	14.50	8.00
Athens.....	1.35	1.75	2.70	2.50	4.50	3.50	9.00	5.00	13.05	6.50	17.10	8.00
Rome.....	1.50	1.75	3.00	2.50	5.00	3.50	10.00	5.00	14.50	6.50	19.00	8.00
McDonough..	1.50	1.75	2.80	2.50	3.40	3.50	4.90	5.00	6.40	6.50	7.90	8.00
Eastman.....	1.70	1.75	3.20	2.50	4.00	3.50	6.00	5.00	8.00	6.50	10.00	8.00
Carrollton....	1.58	1.75	2.84	2.50	4.73	3.50	9.45	5.00	13.73	6.50	18.00	8.00

*Re Georgia Power Co., op. cit., at 160.

both, however, require some patience on the part of the management. One method is to set the new standard rate, leaving the old rates optional where they are lower for certain customers. Then, as the consumption of these customers increases, they will gradually find the new rate cheaper and shift to it. Using this method, the Georgia Power Company would have left the old rates in effect until those customers requiring only 15 kilowatt hours per month could have built their consumption up to about 30, where the standard rate would have become cheaper.

The other method, differing only slightly from this, is probably more commonly used. Here the standard rate is decided upon and the old rates left in effect in certain places as in the method just described, the only difference being that *in order to induce customers to adopt the uniform rate, reductions are made in the standard rate only*. Evidently, by using either of these methods, customers can be shifted to a uniform rate without having their bills increased, the only requirements being a *promotional* uniform rate and the passage of time.¹⁵

Encounters Competition. Another great obstacle in the way of rate uniformity is

competition, both between the utility and outside influences and between industrial firms served by the utility. The first type mentioned should be broken down into (1) those competitive influences which might have an effect upon the whole schedule of rates in a given district, and (2) those which might have an effect upon the rates for certain classes of service only. The first is illustrated by the existence of a publicly owned plant located in an area where the utility is attempting to establish uniform rates; the second by the availability to the utility's customers of substitute sources of power, such as steam, gas, etc.

Several instances of the effect of a municipal plant within an otherwise uniform rate area have been brought to the attention of the writer. From these the conclusion may be reached that if the uniform rate policy has originated with the company, the results are not necessarily serious. That is, the area cannot become strictly uniform as long as low municipal prices must be met in one or two communities, unless the company gives up its franchise in such a town, as was done in the case of a small eastern uniform rate area. But, if the commission has not formally demanded rate

¹⁵ This would necessarily require cooperation on the part of the regulatory commission, however, in order to

forestall the charge of unfair discrimination because of the optional rates in some communities.

uniformity for the territory, it is not likely to force the company to lower its standard rate to the level it has been obliged to set in the competitive portion of its territory.

The consequences will probably be more drastic, however, if, as in the case of the Georgia Power Company, the uniform rate area is initiated by the commission. The incident of the Crisp County publicly owned plant is too well known to justify much discussion here; suffice it to say that, after lowering its rates in Cordele, the county seat, to meet the competitive price of the county electric plant, the Company was shortly ordered to have its representatives appear before the Commission *to show why the new Crisp County rates should not be extended to the entire State*.¹⁶ Obviously, such an action is likely to prove serious to any company.

This should make clear what is meant by a particular type of competition affecting the rates of all classes within a given area. Other instances might be found—for example, the policy of a utility serving at lower rates a city which houses a state legislature, in order to forestall public agitation—but the one presented here is believed very representative of the type of problem which faces many companies.

Another competitive influence is the effect of substitute sources of power upon the possibility and feasibility of the uniform rate area. Those acquainted with the electrical industry generally recognize that, at least in so far as industrial power sales are concerned, its service must take on the characteristics of a highly competitive business. Evidence of this fact is to be found in the low rates which must be accorded large

power consumers, for it is safe to assume that regulatory commissions would not allow such low rates for industrial power in comparison with the higher rates for domestic use, if the former could be acquired on a more nearly total cost basis. The question to be discussed, then, is whether or not, in view of the competitive conditions involved, a uniform industrial power rate is a practicable and just method of charging for such service.

If the utility served a territory in which conditions were very nearly uniform so far as available industrial power substitutes were concerned, a uniform rate policy would be practicable because no industrial concern would have greater bargaining power than another. But such a case would be difficult to find; hence the uniform rate policy must be considered in its relation to *unlike* conditions of available substitutes. Clearly, if the utility desires the business of those industries which are located in sections of its territory where there is an abundance of cheap natural gas, or where coal is cheap because of exceptional transportation facilities or proximity to mines, this competition must be met with a power rate low enough to induce the industrial consumer to use it.¹⁷ Consequently, if the utility is using a uniform rate policy which includes industrial power, it must do one of two things: either it must give up its attempt to sell industrial power in that market, or else bring its entire level down to equality with the rate necessary to attract business in that market. If it feels that the second choice is impossible, is not the uniform rate policy restraining profitable expansion? It is, if this "low value" business would be profitable to

¹⁶ The order of the Commission and the grant of an injunction to restrain the order are reviewed in *Georgia Public Service Commission v. Georgia Power Company*, in the Georgia Supreme Court, P. U. R. 1931 B 225.

The Supreme court reversed the order of the lower court, thereby refusing an injunction.

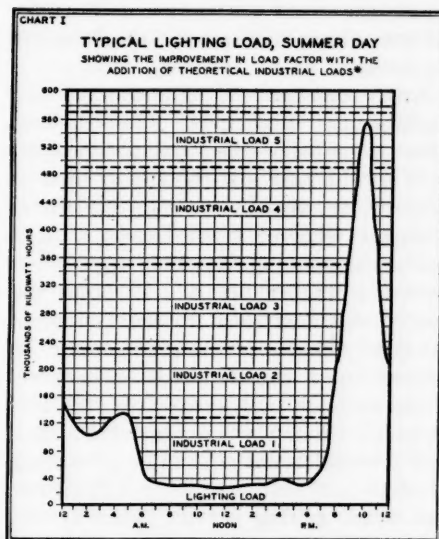
¹⁷ Obviously, not all industrial loads are sufficiently desirable to warrant such an inducement.

the company by contributing something above increment costs without requiring additional investments. Since, in general not all power consumers can be charged on a basis which will repay increment costs plus the *entire* fixed demand costs which may be fairly allocated to them, would a uniform industrial power rate, set low enough to take in the marginal¹⁸ power customers, be a just rate from the standpoint of the domestic consumers upon whom the difference would fall in the long run?

A typical 24-hour load curve is given here to illustrate this point (Chart I). Being a representation of a lighting load on a summer day, the greatest use by far is between the hours of seven and twelve in the evening. This leaves a considerable portion of the plant's capacity unused during a greater part of the 24-hour period. The purpose here is not to give a lengthy discussion of the principles under which industrial loads are taken on at low rates; it is sufficient to point out that any such load, taken on at a price which pays the extra costs incurred in the service and which at the same time contributes something toward the heavy fixed costs of the plant, is profitable from the standpoint of the domestic consumer so long as it merely uses otherwise unemployed capacity and does not create a need for added capacity. The chief reason why industrial consumers are not required to pay *all* fixed charges on that part of the plant capacity used by them is found in the availability of substitutes, which make the value of the service lower to them than to domestic customers.

But the value of the service is not the same for all industrial consumers over an area, as was pointed out above. This fact becomes more evident when the

utility extends its service to two or three hundred communities. Consider the chart at this point, assuming that the management desires to charge industrial power consumers in different localities on the basis of the value of service to



*Curve based on Diagram No. 1, Report of the Saint Lawrence Power Development Commission (Albany: J. B. Lyon Co., 1931), p. 72. This was assumed to be a representative lighting load by Messrs. J. Bauer and J. P. Hogan, Marketing Board of the Commission.

them rather than at a uniform rate. Assume also that the first industrial load is taken on at a relatively high price for such service, since industrials in the communities affected would have to pay high prices for substitute power. This group then would contribute most toward the fixed costs of the plant. Assume also that Industrial Load 2, in order to be obtained, must be conceded a somewhat lower price, since the communities from which this load arises are more advantageously situated with regard to substitute power. This group, however, must pay *something* over increment costs caused by it. In the same manner, Industrial Loads 3, 4 and 5 are taken on, each at a lower rate than the

¹⁸ "Marginal" in the sense of affording the least profit to the company.

preceding one, each contributing *less* toward fixed costs, but all contributing *something* above increment costs. As long as this last is true *and no need for additional plant capacity is created thereby*, such loads are profitable because they lessen the fixed charges which would otherwise have to be met by the domestic consumers.

Now consider the situation if the management attempted to put into effect a uniform industrial power rate. If it set the rate low enough to take in Load 5, it would lose the additional revenues received from Loads 4, 3, 2 and 1, since at the time they were being served at higher prices. Through the loss of this additional revenue more of the fixed charges of the plant would be thrown upon the domestic consumers. If the uniform rate were set at the level at which Load 3 was acquired, Loads 4 and 5 would eventually take advantage of their low-cost, available substitutes and cease taking service, thereby depriving the domestic customers of contribution to the fixed charges from that source, with the same general effect as in the first case.

From this discussion the following conclusion may be reached: Any uniform industrial power rate, unless conditions of substitute power are also approximately uniform, will tend to work a hardship upon domestic consumers by depriving them of some portion of those contributions to fixed charges which are made by industrial consumers. In other words, since industrial power consumers as a class, although profitable within the limits of existing capacity because of the decreasing cost character of electrical generation, do not always pay *entire* costs, the writer believes that

the company is justified in taking advantage of less acute competitive conditions with the relatively greater value of service which results, and charging large power customers on a differential basis, in order that they as a class shall contribute as much as possible toward the fixed charges on that portion of the plant capacity used by them.

One writer, having given considerable thought to the uniform rate area, particularly with respect to its relation to the sale of industrial power, reached the following conclusion:

"Taking a short-time point of view based on the theory that the electric service market is a monopoly market, uniform rates are desirable. With the long-time point of view based on the growing competitive nature of electric service, prices must be flexible and allowed to be adjusted to meet competition between the limits suggested above."¹⁹

Now to return to the discussion of the effect of rate uniformity upon competition between industrial firms doing business within the territory served by a single operating utility. Aside from a minor point—namely, its effect upon industrial concentration—the major factor to be considered is discrimination. Does the uniform rate policy promote or lessen unfair discrimination among such industrials and, for that matter, among the users of any other class of service?

To answer this question one has only to observe a certain generally accepted rule under which utilities are accorded a monopoly in a given territory. This rule is that in rendering their service they must treat alike all customers who are *similarly* situated. Consequently, it has not been considered unfairly discriminatory to classify customers on the basis of use nor upon the basis of time of use. Then all customers of the same classi-

¹⁹ H. Zinder, "Competition and Merchandising," *N. E. L. A. Bulletin*, September, 1930, p. 552. The limits referred to in the quotation are value of service to

the consumer as the upper limit and out-of-pocket costs as the lower.

fication who are similarly situated from a cost standpoint should likewise be similarly situated from a rate standpoint. Also, the question of whether or not they are similarly situated from the value-of-service standpoint is beginning to receive more recognition. Therefore, it is usually held that the uniform rate area eliminates unfair discrimination if costs over the area are also fairly uniform, but it should be just as firmly held that the policy *promotes* unfair discrimination if the costs of service are *not* uniform. Some believe, however, that the policy is non-discriminatory even though costs are not uniform, as long as the value of service can be shown to be uniform.

In order to observe this problem from a slightly different angle, study it from the standpoint of the economist rather than the lawyer. Is there any economic justification for a utility's charging higher rates to those customers in sections which incur a larger proportion of transmission costs, for example? In supplying electricity even to customers within a single city, the utility is providing varying amounts of transportation or delivery service to customers located at varying distances from the point of generation, but it has become an accepted policy to average this transportation cost and apply it equally to all customers of the same class within the city. The problem becomes more apparent when, as is often the case, energy is transmitted to customers 50, 100, and even 200 miles from the source of power. The company, in transmitting power over such distances, is actually adding "utility" to its commodity (in the economist's sense of use-

value; bringing the commodity or service to the place where it is used), or from the point of view of the economist the commodity is still in a stage of production.

Transportation costs, as far as most commodities are concerned, are met by the consumer with no thought of discrimination because he is obliged to pay his own freight charges. For example, there is no equitable justification for a concern manufacturing automobiles to attempt to forecast for a year in advance what its average freight expense per automobile will be and then sell cars at a uniform delivered price anywhere in this country or Europe. The purchaser of a car in Detroit is in no way responsible for the freight charges resulting from the sale of a car in Buffalo. The car in *Buffalo* is worth more to a man in Buffalo than it was when run out of the factory in Detroit; its utility has increased for him as additional increments of transportation expense were incurred; he expects to pay for this additional value himself and does not feel that the Detroit purchaser of a car ought to pay part of his freight costs.

If electricity could be compressed and packaged, it is reasonable to assume that it would be sold f. o. b. power plant and each consumer would pay his own freight charges to the place where he intended to use it, with no thought of his being discriminated against simply because the final cost to him was more than the final cost to a man who lived in the vicinity of the packing plant and who could stop on his way home from work to pick up a week's supply.²⁰

under pressure and shipped in tank cars to small isolated communities where the cost of manufactured gas service through connecting mains would be prohibitive. The liquid gas is then placed in a centrally located storage tank and distributed about the com-

²⁰ A situation somewhat similar to this may become an important factor in the gas industry if the use of propane and butane gases continues to gain in popularity. These gases, hydro-carbons obtained as by-products of the oil refining industry, can and are being liquefied

(Footnote 20 continued on page 160)

Does the mere fact that electricity is transported by means of physical interconnection instead of through the medium of a separate transportation agency in itself justify an equalization of transportation costs? Other things being equal, it does not. There is no economic or equitable justification for consumers near the power station *permanently* subsidizing the transportation costs of those located at a distance.²¹ Whether or not there is *social* justification for such a policy is another matter.

Social Forces

Undoubtedly most rate differences are attacked from the social point of view. When this is done, the costs upon which these differences are presumably based should be broken down into two general divisions: one, the difference in cost resulting from distance from the central station; the other, those differences in local operating conditions which are reflected in costs. In order to operate under strictly uniform rates, both of these general types of costs must be averaged and differences subsequently ignored as a basis for price differentials. From many commission and court deci-

sions, it is evident that such a procedure has often been declared justifiable.²²

The point receiving the greatest defense as a public policy, however, is that of averaging transmission costs. Those who adhere to such a policy do so in the belief that no communities are entitled to advantages resulting from location alone. In general, the desire of all concerned is that this country, or more specifically each state, shall be characterized by thriving communities and prosperous rural areas. When considered in the light of general development of communities, price differentials may very likely have an unfavorable effect upon some of them. This is acknowledged by one utility executive who states, "Industries can locate anywhere in our territory and be assured of uniform rates regardless of location. This tends to give the small towns equal advantages with the cities in attracting industries to their localities, thereby bringing about a gradual development."²³

There are undoubtedly innumerable reasons why communities have located where they are today, but it is improbable that any were consciously located there because such a place would provide

(Footnote 20 continued from page 159)

munity through a local system. Or it may be sold in its liquid form to the individual customers, thus eliminating even the distribution system. This gas is sold f. o. b. the refinery, the consumer paying the freight charge which he himself incurs.

²¹ Perhaps the meaning of this statement should be more fully explained. If the load of that section incurring high transportation costs improves the load factor of the whole system to an extent which gives to the central area an additional advantage of sufficient importance to overcome the transmission-line subsidy it is paying, then such a subsidy is justifiable. But if this situation were to exist, there would actually be no subsidy because the distant area would be making up that difference by improving the system load factor. Likewise, the use of the word "permanently" should be emphasized. Subsidy of a distant section by a central area would clearly be justified from every standpoint, if the policy proved sufficiently promotional in the distant section. In that event, the subsidy would conceivably terminate after a period of years when the

high-cost area had become a profitable market, and would have been justifiable from the standpoint of both groups of consumers. A permanent subsidy, with no such possibility in view, could, in the writer's opinion, be justified only from a social standpoint. This is stated with no intent to disparage the social point of view on such a question.

²² The following are a few cases illustrating this point: *The Milwaukee Electric Railway & Light Co. v. Railroad Commission of Wisconsin*, 171 Wis. 297 (1920); *St. Louis & San Francisco R. R. v. Gill*, 156 U. S. 649 (1894); *Groesbeck v. D. S. & A. R. R.*, 250 U. S. 607 (1919); *People v. McCall*, 245 U. S. 345 (1917); *Re Edison Electric Illuminating Co. of Boston*, P. U. R. 1928 D 859; *Re Alabama Power Co.*, P. U. R. 1929 A 458; *Parker-Young Co. et al. v. State, Baker River Light & Power Co. v. State* (N. H.), 145 Atl. 786, P. U. R. 1929 E 160.

²³ From a letter to the author, dated February 26, 1931, from Mr. Franklin Heydecke, General Auditor, Electric Department of the Public Service Electric and Gas Company (New Jersey).

a strategic position for a steam generating plant; when the majority of our population centers were established, electricity was a thing of the future. Today, with a few large power plants supplying a large interconnected area, the discretion of the management determines for the most part what points in the territory shall become generating centers (assuming more than one desirable site). These points are picked with a view to achieving the greatest possible economy. If the management decides to locate its plant in Community A instead of in Community B, 30 miles distant, assuming they are equally desirable as generating points, is there any *social* justification for lower rates in "A"? As noted previously, from an economic standpoint, differences in cost result from the site chosen and would justify a lower rate in "A." But when one begins to speak of the relative *rights* of "A" and "B" in the situation, the differential becomes more difficult to justify.

In the case of hydro-electric plants the same conclusion may be reached if the argument starts from the premise that the natural resources of the country are the property of the country and not of any distinctly local interests. For example, all advantages of a water power development such as Niagara Falls should not, from the social point of view, accrue to those who reside in its vicinity, especially since it is hard to believe that the population moves to such centers for the one purpose of taking advantage of such natural resources through the medium of cheap power.²⁴

It must be recognized, however, that in putting this theory into practice there is an economic limit to the terri-

tory over which the advantages of natural resources can be extended.²⁵ For example, assuming that the proposed Saint Lawrence River hydro plant is able to produce large quantities of power at low rates, to attempt to supply the whole State of New York from that source would undoubtedly turn the originally contemplated advantages into disadvantages because of the high cost of transmitting power over such long distances. Hence the writer does not urge that the product of hydro plants be made available to everyone within possible transmission-line distance. He does, however, hold it to be socially desirable that such power be made available to as great an area as may be shown to be economically reasonable.

The policy of averaging *local* cost differences among communities, as well as transmission costs, is more difficult to justify. Yet in order to achieve strict uniformity it must be accomplished. The question is how to supply high-cost territory, such as rural areas and outlying small communities, at a price within the value of service to them. In general, the main argument which can be advanced is that the supplying of electricity has become such an essential service that all have the right to receive it; and, if subsidy of rural and outlying districts by more densely populated sections is necessary, it is justified on those grounds. It has already been pointed out that such a policy might prove profitable at some future time as a result of development and growth in the high-cost areas with a corresponding increase in consumption. But this cannot be relied on in all cases.

Selling power by means of a graduated schedule increasing as distance from the

²⁴ This reasoning obviously does not apply in the case of industrial plants which are accorded low rates at the source in order to provide a high load factor.

²⁵ Such a study is another suggested for the consideration of the Public Utility Corporation of the State of

Wisconsin, which has been already mentioned. If the Saint Lawrence project is ever developed by the State of New York, such a survey might well be demanded by the public, as the first step in determining the rate adjustments to be made as a result of the development.

station increases would tend to give an additional increment of economic rent to the central location; conversely, serving at uniform rates would tend to eliminate this particular advantage. Consumers in population centers are paying higher prices for rent, food, taxes, et cetera, in order to obtain the advantages of central location, and it might be claimed that for this reason they should not be compelled to pay part of the expenses of serving outlying areas with electricity. But there is another side to this argument—namely, that those in the central area are likely to have higher incomes; in general, an adjustment in salaries takes into account the differences in living costs between large cities and small communities. This might be considered as an argument for low rates in the latter. Little objection is made to the statement that for the most part rural incomes are low; consequently, it could be argued that, from a social standpoint, this alone is sufficient reason for low rates to the farmer, since the service has become so essential for a comfortable standard of living.

The first argument stated above—namely, that the advantages of a central location should not be destroyed—cannot hold in a discussion of rural rates. The farmer is located at a distance from necessity, not from choice. He cannot pick up his business and move to a central location. Or to look at the same situation from another angle, the farmer is rendering an essential service to the city and in so doing he cannot possibly escape being in a high-cost situation with regard to electric service. When looked at in this light a possible social justification may be found for averaging costs and partially subsidizing rural areas by city consumers.

A somewhat similar argument can be advanced in favor of averaging rates between urban and suburban areas. This is based upon the assertion that such a policy would help in developing the suburbs and that the suburbs are worth developing because they serve a good purpose in providing better living conditions for those who must work in congested population centers. There seems to be some merit in the statement that by affording a means of decentralization of population, the suburban areas are contributing a service to the urban which *might*, on social grounds, justify some degree of subsidy. How it can be justified on the economic grounds suggested by one writer, however, is not apparent. Using telephone rates as an analogy, this writer states:

"Larger users of telephone service such as mercantile organizations are usually entirely willing to have included in the rate which they are required to pay for telephone service a portion of the cost of serving people in outlying districts so that these latter will install telephone service and place themselves in communication with the larger users as prospective customers."²⁶

Undoubtedly, in the case of telephone service, connection with outlying districts is of sufficient value to the commercial subscribers in the central area to warrant their paying part of the costs of service in such districts; connection between two points is essential to telephone service. But it is not clear how this particular analogy can be carried over into the field of electric service where such a connection is *not* essential to service.

Conclusion

An attempt has been made to present some of the more important considera-

²⁶ F. B. Doolittle, "Notes on Uniform Rate Districts," Report of the Rate Research Committee, Appendix B,

pp. 12, 13, *National Electric Light Association Proceedings*, 1923.

tions to be weighed by either utility executives or utility commissioners when analyzing the uniform rate area as a territorial rate policy.

As a further consideration, the writer wishes to point out the possible danger, to industry in particular, of a headlong plunge into uniform rates over a considerable area. Any industries which have given serious consideration to the price of power in their choice of a location will probably experience considerable hardship if the utility is forced by public demand to unify rates at a given time. A more logical course seems to be to select the uniform rate area as a

goal to be reached by a gradual process of controlled evolution.

A final statement is intended for those to whom the uniform rate area has appeared to be an expedient way out of public relations difficulties. As new inventions and new processes provide additional and more economical substitutes for electric power, the competitive portion of the market may tend to be enhanced and the monopoly characteristics lost to a greater degree; as a result, the danger of strict uniformity in pricing for a service in a market ruled by value of service will become greater and may cause its final downfall.

II. Building Costs and Total Costs at Sunnyside Gardens, L. I.*

By ROSALIND TOUGH

SINCE the City Housing Corporation is a limited dividend Company and semi-philanthropic in character, it is in a position to make public its experience in the building of Sunnyside Gardens in a way impossible to most profit companies, which are not desirous of having their cost data available to their competitors. Generally, if such private material is presented at all, it is given in more or less summary form without the necessary detail to make it of value to other organizations. In contrast, the City Housing Corporation desires that commercial and non-commercial undertakings in the field of housing benefit by its experience and therefore the Company has permitted an analysis to be made of the costs involved in bringing the Sunnyside project into existence.

Costs of a housing project may be divided into two classes: (1) those which are essential to the production of urban sites and (2) those which are involved in the construction of building improvements. The production costs of the land for Sunnyside Gardens were given in the previous issue of the *Journal*, and this installment will complete the analysis by presenting the building costs in detail and in their relation to the land costs. Land costs and building costs taken together constitute the total cost of the Sunnyside project.

As a point of departure, one or two facts in the previous article may be re-

capitulated briefly. Unimproved land costs amounted to \$859,581.²⁶ The production costs of urban land, i. e., the costs involved in preparing the land for urban use, totalled \$534,417. Together these constitute an amount of \$1,393,998, the cost of land ready for building purposes.

Definition of Terms

Family. The term "family" is defined in terms of the housing unit. Thus the statement that there are 1,202 families in Sunnyside Gardens means that housing accommodations are available for 1,202 families.

Joint Land Cost. The produced urban land cost of streets and of the park area constitutes the joint land costs at Sunnyside Gardens. The street cost was distributed among the various types of uses in direct proportion to the area used for each specific purpose. In contrast, the cost of park areas was added only to the land cost of dwellings, on the basis of benefits derived, and not to the cost of land used for other purposes. Since the persons living in Sunnyside Gardens benefit from the existence of park space, the cost of this land has been apportioned, more or less arbitrarily, on the basis of the number of families accommodated in each type of housing provided.²⁷ Thus, all joint land cost of the park areas in the Sunnyside

²⁶ By unimproved land is meant land having neither buildings nor public improvements. Production costs included a combination of two costs: "direct" costs, i. e., taxes and public improvement costs, and "indirect" costs, i. e., simple interest on: (1) capital invested, (2) taxes, and (3) public improvements.

²⁷ Since Sunnyside Gardens was completed in 1928

(Footnote 27 continued on page 165)

* For the first installment of this article see 8 *Journal of Land & Public Utility Economics* 43-54 (February, 1932). Since this article completes the earlier study, tables and footnotes are numbered consecutively following those in the earlier analysis.

project is included as part of the cost of urban sites used for dwelling purposes.

Building Cost. The term "building cost" includes construction costs, contractor's fee, carrying charges and overhead during construction, and architects' fees. The work on the first three units at Sunnyside Gardens was done by a general contractor on a cost-plus basis, the contractor's fee being determined on a sliding scale which went down according to the volume of business. On the fourth and fifth units at Sunnyside, the City Housing Corporation had its own construction department. Therefore, on these units contractor's profits were eliminated and the cost of maintaining the department became a charge on the organization in the form of overhead.

Construction Cost. This term embraces the total cost of materials and labor used in the erection of all building improvements at Sunnyside Gardens.

Carrying Charges During Construction. These costs include three items: all interest and taxes attributable to land during construction of building improvements;²⁸ interest on capital used for building improvements, and insurance

charges. All carrying charges attributable to land prior to the undertaking of building construction were included under production costs of the site. As soon as income began to come in from some of the properties, before the entire project was completed—i. e., through the sale of homes or through rentals of apartments, garages, and stores—the carrying charges on these income-yielding units were omitted.

Overhead, Contractor's and Architects' Fees. Overhead included supervision expense, the Company's administrative expense, and selling expenses.²⁹ All overhead charges attributable to land prior to the undertaking of building construction were eliminated. The method of ascertaining the contractor's fee was described under "building cost." Architects' fees are self-explanatory.

Interest. In ascertaining all interest costs for the City Housing Corporation's properties, a simple interest rate of 6% was adopted instead of a compound rate of 4%. Since the former was the rate at which the City Housing Corporation procured its capital, it was thought to be more valuable for the purposes of this study to follow the actual experience of

(Footnote 27 continued from page 164)

to provide housing for 1,202 families, the joint land cost was apportioned to the various housing utilities on the basis of this number of families. However, there are 344 families, accommodated in an apartment project built on land sold by the City Housing Corporation, who have the privilege of using the Sunnyside Park. Therefore, a share of the cost of the park space might rightly have been apportioned to them. However, the park area was planned for the Sunnyside Gardens residents without consideration of these 344 families. Since the latter are not Sunnyside residents and since the park space was set aside without considering them, it has seemed advisable to apportion this joint land cost only to the land used for dwellings within Sunnyside Gardens rather than to include the land sold by the Corporation. In any case, since the joint land cost is relatively small, the adoption of either method does not make a significant difference in arriving at the costs.

²⁸ At Sunnyside Gardens land was considered to be ready for urban use as soon as building construction

began. Therefore, accruing costs on land during construction of each of the five separate units of buildings were considered to be building costs. This policy is common practice in real estate operation and was therefore followed throughout this study with one exception. Total public improvement costs have been considered to be a production cost of urban land, even though actual work was undertaken after building construction was well under way. The reason for this deviation from the actual procedure of the Corporation is that land is not completely ready for urban use until public improvements are installed, so that the costs involved for these improvements are rightly considered as production costs of urban land.

²⁹ Because of the semi-philanthropic character of the City Housing Corporation the board of directors and the officers of the Company have given and continue to give their services without compensation. This has materially reduced the Company's administrative expense.

Legal expenses in connection with sales are included in selling expenses.

the Corporation than to use arbitrarily a compound interest rate of 4%.

Planning Technique

At the time of purchase in 1924, the Sunnyside area did not present an attractive physical appearance. Since the latter part of the 19th century, it had been lying idle. Public improvements were few. In addition, the presence of the Pennsylvania and Long Island Railroad's Sunnyside yard, a short distance to the west, did not add to the desirability of the site for residential use.

A compensating feature was the fact that the land lies in the first ward of the Borough of Queens. Since 1917 it has been adequately served with transportation facilities and comes within the radius of the five-cent fare within New York City. Moreover, the general region had attracted other organizations interested in housing. The Metropolitan Life Insurance Company, for example, had taken advantage of legislation passed in New York State permitting life insurance companies to invest part of their funds in the erection of apartment houses to rent at not more than an average of \$9.00 per room per month. One of the Metropolitan developments is located on Forty-Eighth

Street (Old Gosman Avenue) across Queens Boulevard from the City Housing Corporation's property. Although there were no streets in the area in 1924, the program of street development had already been officially established—namely, the gridiron plan found within the city limits of New York. Consequently, in planning the use of the land, City Housing Corporation had no opportunity to determine the percentage of the area to devote to streets or the positions of these streets. It could only plan the utilization of rectangular city blocks.

This utilization of city blocks within Sunnyside Gardens is one of the most outstanding features of the project. Despite the fact that the apartment house coverage is 40%³⁰ of the net usable lot area, the area covered by all buildings at Sunnyside averages 28%,³¹ with 72% devoted to gardens and lawns. Each house has its individual garden and each block interior constitutes a central garden and playground. This condition is secured for the future by 40-year deed restrictions.

In addition to making generous provision for vacant area, the plan at Sunnyside Gardens allocated space for park

³⁰ The apartment house coverage at Sunnyside Gardens is a contrast to the areas specified for "new tenement blocks" which are as follows:

- "(a) in case of a corner lot not more than 90 per centum;
- (b) in case of an interior lot which exceeds 90 feet in depth and does not exceed 105 feet in depth not more than 70 per centum;
- (c) In the case of an interior lot which exceeds 105 feet in depth not more than 65 per centum."

(McKinney, Wm. M., *The Consolidated Laws of New York Annotated*, volume 9, 1918, Book 60, "Tenement House Law," §50, p. 33.)

³¹ Henry Wright who was associated with the architects, Clarence S. Stein and Frederick L. Ackerman, on the city planning aspects of Sunnyside Gardens, presents the following opinions concerning the land coverage of multi-family dwellings.

"It is evident that for buildings of maximum plan efficiency, the range of land coverage lies between

generous openness at 50% and undesirable congestion at 70%. This range of 20% even in non-elevator buildings of four or five stories has a value of less than \$100.00 per room in land costing \$4.00 a square foot (or \$500.00 a front foot 100' deep). The architect will hesitate to overcrowd his plan when he realizes that the maximum rent saving (between the two types of uses) is only about \$1.00 per room per month . . . It is probable that Mr. Stein's plans which have been casually criticized as being wasteful of land because of their very large inner courts are in fact among the most efficient and most economically well-balanced buildings to be found." (Wright, Henry, "The Modern Apartment House," 65 *Architectural Record* 229-30 (March, 1929).)

It is of interest to note here that the cost of urban land ready for building purposes at Sunnyside Gardens was only 86.9 cents a square foot. This is a much smaller figure than the \$4.00 mentioned in Mr. Wright's quotation and is one explanation for the large amount of open space within the Sunnyside project.

purposes. An area of 3.13 acres (about 6% of the total area in the project) was set aside for this purpose. City Housing Corporation completely equipped it with playground facilities and in 1926 deeded it to the Sunnyside Gardens residents.

Types of Building Improvements

Seven different types of building improvements are to be found at Sunnyside Gardens: one-, two-, and three-family houses, two cooperative apartment buildings, three rental apartments, individual garages, a two-story, steam heated garage, a one-story store building, and a two-story store and community building (Map IV).

Among the various types of dwellings, the one-, two-, and three-family houses predominate, accommodating 73% of

the families. The remaining 27% live in apartments (Table IX).³²

Since economy dictated that each small house form an integral part of a united whole, a group design was adopted, with six or seven group units to each rectangular block. These group units are related to open spaces and to community facilities and activities. In contrast to the usual monotony of the row houses, the buildings are irregular as to setback from the street, producing a result of pleasing variety, which is further promoted by use of the gable roof. Economy of construction is achieved through simplicity of design and through the use of common brick. No house in Sunnyside is more than two rooms deep.

TABLE IX. NUMBER OF DWELLINGS AND FAMILIES ACCOMMODATED IN EACH TYPE OF STRUCTURE, SUNNYSIDE GARDENS, LONG ISLAND.*

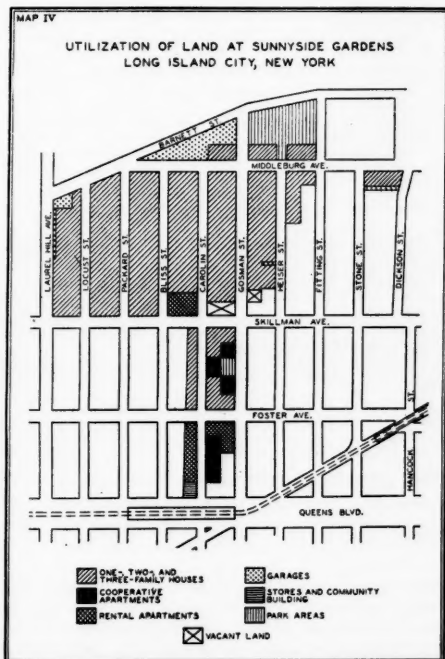
Type of Dwelling Improvement	Number of Buildings	Families Accommodated	Percentage of Total Buildings	Percentage of Total Families
Total	577	1,202	100.0%	100.0%
One-family houses	293	293	50.8	24.3
Two-family houses	224	448	38.8	37.3
Three-family houses	46	138	8.0	11.5
First cooperative apartment	6†	40	1.0	3.3
Second cooperative apartment	5†	32	.9	2.7
Rental apartments	3	251	.5	20.9

*Data from files of City Housing Corporation, S. C.—9.

†First cooperative apartment comprises six units; second cooperative comprises five units.

Two co-operative apartments were built in 1924 and 1925, the first housing 40 families and the second 32, or together 6% of the total families living in Sunnyside Gardens.

³² In Sunnyside Gardens 89.6% of the dwellings are of the one- and two-family type (Table IX). In contrast, recent construction of dwellings in the whole Borough of Queens has tended toward the multi-family dwellings. The United States Bureau of Labor Statistics considers a multi-family dwelling to be one which accommodates three or more families. For example, in 1927, 50.5% of the new dwellings built in Queens were of the one- or two-family type; in 1928, only 39.2% of the new dwellings were of this type. (United States Bureau of Labor Statistics, 28 *Monthly Labor Review* 156 (January-June, 1929).)



*Most of the garages, including the steam heated garage, are located between Barnett Street and Middleburg Avenue, adjacent to the Pennsylvania and Long Island Railroad. However, a few individual garages are found at the edges of the project on Laurel Hill Avenue, and Heiser and Dickson streets.

Additional multi-family dwellings are rental buildings—namely, Hamilton Court, Monroe Court, and Wilson Court—housing approximately 21% of the total number of families. These three buildings include 14 stores. All multi-family dwellings are three, or four, and some slight portions, five stories in height. They are non-elevator apartments, known in the real estate field as “walk-ups.”

A one-story store building and a two-story store and community building adjoin the Wilson Court Apartment. These structures are temporary in character and function largely as “taxpayers.”

Since garages at Sunnyside are not found in the back yard, because there is no back yard in the usual sense, provision had to be made for this necessary adjunct to the modern house.³³ Because part of the tract adjoined a railway and was therefore relatively unsuited to residential use, the garages were located at this point, i. e., between Middleburg and Barnett Avenues. Part of the area was used for the two-story brick and concrete garage and the remaining land for individual garages of brick and metal construction.

Building Cost

The total cost for all buildings at Sunnyside Gardens was \$6,564,180 (Table X). Since construction of building improvements was undertaken in a systematic manner, i. e., in five separate units from 1924 to 1928 inclusive, it was possible to use large-scale building and planning technique resulting in economies which are not available where a few structures are built at a time in a

more or less haphazard manner. Specifically these economies took the form of economical purchase and utilization of materials and relatively small carrying charges during construction of building improvements. To no small extent these savings resulted from the fact that before or as soon as each unit of construction was finished all the houses were sold. In other words, because of the shortage of homes resulting from

TABLE X. RATIO OF BUILDING COST TO PRODUCED URBAN LAND COST, SUNNYSIDE GARDENS, LONG ISLAND.*

Type of Use	Produced Urban Land Cost†	Building Cost‡	Percentage of Building Cost	Ratio of Building Cost to Produced Land Cost
Total.....	\$1,393,998	\$6,564,180	100.00%	4.7:1
One-, two-, and three-family houses.....	1,143,582	4,793,054	73.02	4.2:1
First cooperative apartment....	31,182	174,000	2.65	5.6:1
Second cooperative apartment.....	29,659	183,000	2.78	6.2:1
Rental apartments.....	100,922	1,086,283	16.54	10.8:1
Individual garages.....	45,766	85,949	1.31	1.9:1
Two-story garages.....	20,741	181,346	2.78	8.7:1
Two-story store and community building..	4,060	29,025	.44	7.1:1
One-story store building.....	3,775	31,523	.48	8.4:1
Vacant land.....	14,311	.....	.....	.....

*Data from Herbert Emmerich, Executive Vice President of the City Housing Corporation, and from the files of the Corporation, S. C.-9.

†In ascertaining the produced urban land costs, a joint land cost of \$81,654, representing the cost of the park areas, was included. This cost was added only to the land used for dwelling purposes, and was apportioned on the basis of the number of families accommodated in each type of use.

‡Includes construction cost, contractor's fee, carrying charges and overhead during construction, and architectural fees.

lack of construction during the war and the immediate post-war era and because the housing utilities at Sunnyside were attractive, all properties offered for sale were marketed rapidly.³⁴ Thus it was

room houses with attached garages in the rear, separated from the houses by a driveway, were built on the lots fronting Middleburg Avenue between Stone and Dickson Streets. It will be noted, however, that these houses are one block distant from the main Sunnyside development.

³⁴To encourage the construction of dwellings in the (Footnote 34 continued on page 169)

³³The important point concerning the grouping of the garages is that by this means the interior portions of the blocks were kept free of obstructions. Through the use of deed restrictions creating interior block courts, this space became available for recreational purposes to all persons living in the block. A few six-

possible to complete the plan of construction in an orderly and economical manner, approximately one unit a year, without incurring any of the losses which result from carrying unsalable properties over long periods of time.

Relationship of the Various Costs to the Total Cost

The total cost of Sunnyside Gardens was approximately \$8,000,000. The unimproved land cost and the production costs were 10.8% and 6.7% respectively of this amount, constituting together only 17.5% of the total cost of the project (Table XI and Chart I). It is

TABLE XI. RELATIONSHIP OF VARIOUS COSTS TO THE TOTAL COSTS OF LAND AND BUILDINGS AT SUNNYSIDE GARDENS, L. I.*

	Cost	Percentage of Total Cost
Total Cost of Land and Buildings...	\$7,958,178	100.00%
Site Costs		
Unimproved land cost.....	859,581†	10.80
Production costs...	534,417‡	6.71
Building Costs		
Construction cost..	5,620,984	70.64
Carrying charges, overhead, and architects' fees..	943,196	11.85

*Data from Herbert Emmerich, Vice President of the City Housing Corporation; from Ralph Eberlin, Chief Engineer, City Housing Corporation; from files of the Corporation, S. L. 2, S. L. 3; and from Department of Taxes and Assessments, Borough of Queens, N. Y.

†\$859,581 is the cost of the land without public improvements.
‡\$534,417 includes the cost of public improvements in the land now constituting Sunnyside Gardens plus taxes on each parcel of land before building operations were begun plus simple interest at 6% on the following: on capital invested to the date of the beginning of building construction in each unit; on taxes computed from the date each tax was due to the commencing of building construction, and on public improvements from the period of their installation to the date of undertaking of building construction.

(Footnote 34 continued from page 168)

immediate post-war era, in 1920 the New York State Legislature passed an enabling act which with later amendments permitted the governing body of a county or the governing body of a town, village, or school district to exempt from taxation until January 1, 1932 all dwellings constructed between April 1, 1920 and April 1, 1925. However, completion for occupancy had to be effected within two years after commencement of construction. Since construction was deemed to be commenced when the plans had been filed with the proper authority and excavation actually and in good faith begun, the first unit at Sunnyside Gardens was enabled

thus apparent that the land costs for Sunnyside Gardens were relatively small as compared with the building costs. These latter may be divided into construction costs, which were 70.6% of the total cost, and contractor's fee, carrying charges, overhead, and architects' fees of 11.9%. Thus the building costs constituted 82.5% of the cost of bringing the project into existence.

Ratio of Building Cost to "Produced" Land Costs

For the whole Sunnyside project the ratio of building cost to produced land cost was 4.7:1 (Table X). For the houses, this ratio was lower than the average for the project, namely, 4.2:1. In contrast, for the rental apartments it was 10.8:1. The latter ratio cannot be said to represent intensive use of land, inasmuch as the buildings are in general four stories in height and cover only approximately 40% of the net usable area.

However, all ratios of building cost to urban land cost at Sunnyside Gardens are relatively high. The explanation for this lies in the low costs of land. In 1924 the City Housing Corporation made very favorable purchases of land which constituted the unimproved site.³⁵ Public improvements, essential to the creation of urban sites, were economically constructed by the engineering department of the Corporation. In addition, taxes and interest charges on the land were small because the corporation was able to produce urban sites rapidly and to use them upon completion for building improvements which were marketed before or immediately after they were finished.

to benefit by the provisions of this act. (McKinney, Wm., *Consolidated Laws of New York Annotated*, Vol. 13, 1928, Tax., §4b, p. 60.

³⁵ The cost of the unimproved site was 53.6 cents a square foot; production cost of the land ready for urban use was 86.9 cents a square foot.

The cooperative apartments have a lower ratio of building cost to produced land cost than the rental apartments. Since the average amount of land assigned to each group of cooperative buildings is about the same as that used for each rental building and since the locations of the sites are equally advantageous for the two types of dwellings, neither area nor cost of the site accounts for the lower ratios for the cooperatives.³⁶

Further, although the cooperatives built in 1924 and 1925 were among the first buildings constructed by the Corporation, the general indexes of costs of construction for the United States in that period were somewhat higher than in the years immediately following.³⁷ Explanation of the lower ratios must therefore be sought in some other factors. The Corporation made a special effort to build the two cooperatives at small cost so that the apartments could be offered to prospective tenant owners on the basis of a "price appeal." Also, whereas the first and second cooperative buildings house 72 families, or an average of 36 families each, the three rental buildings house 251 families, or an average of almost 83 families per building. Increased housing accommodations involved larger building expenditures and therefore a higher ratio of building cost to produced land cost.

Housing Cost per Family

The land and building costs for the various types of dwellings at Sunnyside

³⁶ 30,265 square feet of land was the average used for each of the two cooperative apartments and 31,224 square feet for each of the three rental buildings.

³⁷ In the construction of a six-room brick house a weighted index for building material prices, paid by contractors in 60 cities of the United States, was 203% in 1924, 195% in 1926, and 183% in 1928. (1913 prices = 100%.) A weighted index of construction costs combining indexes of wages and building materials in 12 cities of the United States was 202% in 1924, 197% in 1926, and 199% in 1928. (*Survey of Current Business*,

Gardens were \$7,541,683³⁸ (Table XII). These structures accommodated 1,202 families so that the average building cost per family was \$6,274. For the small dwellings costs per family were approximately \$500 larger than the average cost, while for the rental apart-

TABLE XII. AVERAGE COSTS PER FAMILY FOR VARIOUS TYPES OF DWELLINGS AT SUNNYSIDE, LONG ISLAND, 1924-28.*

Type of Dwelling	Families Accommodated	Building Cost	Average Building Cost per Family	Land and Building Cost†	Average Land and Building Cost per Family
Total‡	1,202	\$6,236,337	\$5,188	\$7,541,683	\$6,274
One-, two-, and three-family houses	879	4,793,054	5,453	5,936,637	6,754
First cooperative	40	174,000	4,350	205,182	5,130
Second cooperative	32	183,000	5,719	212,659	6,645
Rental apartments	251	1,086,283	4,328	1,187,205	4,730

*Data from Herbert Emmerich, Executive Vice President of the City Housing Corporation and from the files of Corporation S. C.-9.

†Includes cost of produced urban land, construction costs, contractor's fee, carrying charges and overhead during construction, and architectural fees. In ascertaining the produced urban land costs for each type of dwelling, a joint land cost of \$81,654 representing the cost of the park areas was included. This cost was added only to the land used for dwelling purposes and was apportioned on the basis of the number of families accommodated in each type of use.

‡This total is for dwellings only and does not include all the building improvements found in Table X.

ments they were more than \$1,500 lower than the average. This difference may be explained in terms of types of accommodations in the various buildings. In general, there are fewer rooms per family in the apartments than in the one-, two-, and three-family dwellings; the average number of rooms per family in a rental apartment is 3.4 in contrast to 4.9 in the small dwellings³⁹ (Table XIII).

1931 Annual Supplement, Bureau of Foreign and Domestic Commerce, Washington, p. 190.)

³⁸ The \$7,541,683 is the land and building cost of the dwellings and therefore does not include the costs of garages, one-story store building, the two-story store and community building, and vacant land.

³⁹ The amount of space adequate for the needs of each family varies with the number of members. "From

(Footnote 39 continued on page 171)

TABLE XIII. AVERAGE COSTS PER ROOM FOR VARIOUS TYPES OF DWELLINGS AT SUNNYSIDE GARDENS, L. I., 1924-28.*

Type of Dwelling	Families Accommodated	Number of Rooms	Building Cost†	Average Building Cost per Room	Average Number of Rooms per Family
Total.....	1,202	5,576‡	\$6,236,337	\$1,118	4.6§
One-, two-, and three-family houses.....	879	4,344	4,793,054	1,103	4.9
First cooperative.....	40	178	174,000	978	4.5
Second cooperative.....	32	155	183,000	1,181	4.8
Rental apartments.....	251	899‡	1,086,283	1,208	3.4§

*Data from Mr. Herbert Emmerich, Executive Vice President of the City Housing Corporation and from files of the Corporation, S. C.-9.

†Includes construction costs, contractor's fee, carrying charges and overhead during construction, and architectural fees.

‡These figures include space equivalent to 44 rooms used for 14 stores.

§The average number of rooms per family does not include the space equivalent to 44 rooms used for store purposes.

A comparison may be drawn between the Sunnyside data and other figures on per-family building costs. For example, in the Borough of Queens for the first six months of 1927 per-family construction costs for one- and two-family dwellings were \$5,447 and during the same period for 1928, \$5,210.⁴⁰ In the Sunnyside project per-family construction costs for small homes were \$4,623.⁴¹ From these data it appears that per-family costs of small homes in Sunnyside Gardens were several hundred dollars less than the average for the Borough of Queens. However, in making a comparison of these two sets of data several limitations should be noted. (1) The per-family cost of homes in Sunnyside

Gardens covered the period 1924-28, whereas the data for Queens embrace only the first six months of 1927 and 1928. If the United States Department of Commerce indexes⁴² of construction costs and building material prices are accepted as applicable to the Borough of Queens, then construction undertaken in 1927 and 1928 was somewhat less costly than that for the two years preceding. This factor may be accepted as one cause for the reduction of construction costs at Sunnyside Gardens. (2) In arriving at per-family costs of small homes for the Sunnyside development, one-, two-, and three-family dwellings were included in the classification, while the figures for small dwellings in the Borough of Queens apply only to one- and two-family structures. Since it is usually conceded that, if type of construction remains the same, the cost per family is decreased as the number of families increases, the inclusion of the three-family houses in the Sunnyside Gardens data would tend to make these figures relatively small compared with the per-family cost for small homes in the whole Borough of Queens. (3) For the purpose of this study, the term "con-

⁴⁰ Average cost of dwelling accommodations per family in the Borough of Queens, New York City, for the first six months of 1927 and 1928:*

	1927		1928	
	Number of Families Provided for	Average Cost Per Family	Number of Families Provided for	Average Cost Per Family
One- and two-family dwellings†.....	9,361	\$5,447	7,040	\$5,210
Number of multi-family dwellings‡.....	8,205	3,382	10,976	3,499
All classes.....	17,566	4,483	18,016	4,168

*Data from United States Bureau of Labor Statistics, 25 *Monthly Labor Review* 1045 (July-December, 1927); 27 *Ibid.* 899 (July-December, 1928).

†Includes one-family and two-family dwellings with stores.

‡Includes multi-family dwellings with stores. A multi-family dwelling is one designed to accommodate three or more families.

⁴¹ Construction cost includes the cost of labor and materials and excludes contractor's fees, carrying charges, overhead, and architects' fees.

⁴² For these indexes see footnote 37.

(Footnote 39 continued from page 170)

the point of view of standards of living a housing standard of one room per person exclusive of bath has been adopted as the minimum requirement consistent with both health and decency." Bureau of Applied Economics, *Bulletin* No. 7, Washington, 1920, p. 15.

It was hoped that the rental apartments of Sunnyside Gardens would serve as steps on the ladder to home ownership and this has been the case to a certain extent. An analysis of the sources of prospects to whom sales were made shows that 55% of them were either friends of Sunnyside Gardens residents or persons already living in the rental apartments.

struction cost" includes the cost of materials and labor used in the erection of all building improvements and excludes contractor's fee, carrying charges, overhead, and architects' fees. The figures available for Queens are also construction cost figures, but are based upon contract prices as given by the builder at the time of his application for a permit. Since figures from building permits are generally low, the results are limited in their usefulness as a basis of comparison with cost data.⁴³

(4) An additional consideration is the wide diversity in the character of the structures included in the per-family cost analysis in the Borough of Queens, i.e., representing both cheap and expensive construction, whereas the Sunnyside cost figures included only data for a uniform type of good housing construction. This factor in itself, however, does not produce high-cost homes if, as in Sunnyside Gardens, the buildings are well planned and economically built.

(5) Finally, information as to the average number of rooms per family was not available in the data for Queens. Should the average space accommodations per family be larger for the latter than those in Sunnyside Gardens, this factor would tend to raise per-family construction costs.

In contrast to the per-family construction costs of small homes in Sunnyside

Gardens which were below the average for the Borough of Queens, per-family costs for apartments were above the average for multi-family dwellings in the Borough. Thus, for Sunnyside Gardens per-family construction costs were \$3,919 whereas for Queens, in the first six months of 1927 and 1928, they were \$3,382 and \$3,499 respectively.⁴⁴

Since the limitations presented in the comparison of the two sets of data for small homes are equally applicable to construction cost figures for apartment houses, it seems futile to offer any one explanation of the apparent higher costs. It is perhaps better to point out that despite these limitations, the average per-family cost for all types of dwellings in the Borough of Queens was \$4,168 and for Sunnyside Gardens \$5,188, a difference of approximately \$1,000. When consideration is given to the larger proportion of small dwellings within Sunnyside Gardens as compared to those built during 1927 and 1928 in other parts of the Borough of Queens and when sufficient weight is placed on the tendency of building-permit figures to be low, the discrepancy in cost is more apparent than real. In other words, through careful planning and economy in construction superior housing utilities were produced in Sunnyside Gardens at a cost not widely divergent from that generally prevalent for the whole Borough of Queens.

⁴³ The limitations of figures taken from building permits for purposes of comparison with data obtained from other sources are well set forth in the following quotation. "The figures of cost are computed from the estimated cost of construction, submitted by the builder in applying for a building permit . . . The overwhelming majority of all the estimates submitted are undoubtedly low. Tax assessors have access to such records and with the heavy tax burdens borne in nearly all cities by land and its improvements, very few builders would wish to suggest any higher value than the expected minimum for the type of structure planned. These figures are of use therefore only in making comparisons between years and types of build-

ings on the assumption that the percentage of 'mark down' in the estimates remains approximately uniform. . . . The data . . . include all types of buildings erected, the cheap and inexpensive as well as the costly and elaborate. Thus differences in costs per family might be attributable to the erection of more expensive dwellings for a different type of occupancy rather than an economy in building for any one class of occupant." Woodbury, Coleman, "Apartment House Increases and Attitudes Toward Home Ownership," 7 *Journal of Land & Public Utility Economics* 300, n. 12 (August, 1931).

⁴⁴ See note 40, *supra*.

Building Cost per Room

In contrast to the low *per family* building costs in the rental apartments at Sunnyside Gardens, *per room* cost in these structures was above that for any other type of dwelling in the Sunnyside project. The average per-room cost for small houses was \$1,103 and for rental apartments \$1,208 (Table XIII). This higher per-room cost of the rental buildings may be accounted for on the basis of small size of the rental apartments with consequently relatively high cost for plumbing fixtures, kitchen equipment, etc. Fireproofing requirements of the building code further increased the cost. This code stipulates a different type of construction for multi-family dwellings than for small homes. The result is anomalous; whereas a relatively large number of families accommodated in the rental buildings reduced the per-family cost of housing, this same factor tended to raise the per-room cost above that of any of the other types of accommodations offered.

However, for the first cooperative building constructed at Sunnyside Gardens the average per-room building cost was lower than that for any of the other structures—namely, \$978 per room. This illustrates the generally postulated economy of multi-family housing. Since the average size of the apartments in these cooperative buildings was 4.5 rooms and that of the small houses was 4.9 rooms, these two types of housing accommodations are more comparable as to size than are the small homes and the rental buildings. On the other hand, for the second cooperative apartment buildings, per-room building costs were \$1,181, \$203 per room above that for the first cooperative apartment. The greater

cost of the second undertaking as compared with the first was attributable largely to improvements in construction. Certain limitations on a comparison of building costs on a per-room basis should be pointed out. If type of construction, relative size of rooms, or year of construction for two sets of data differs, costs will vary as a result of these differences and not primarily because one group of figures applies to multi-family dwellings and the other to small houses. When, as in Sunnyside gardens, the rental apartments also include stores, this is an additional factor tending to affect per-room cost.⁴⁵ However, despite these various influences, the generalization may be made that for the Sunnyside project, with the exception of the first cooperative apartment, the per-room cost of multi-family dwellings was above that of the small dwellings, largely because the former were somewhat superior in construction to the latter.

Significance of the Sunnyside Gardens Cost Data

The fact that the total cost of Sunnyside Gardens was approximately \$8,000,000 cannot be used as a basis for estimating that another similar project would cost about the same amount. Nor can the relationship established between land and building costs for Sunnyside Gardens, i. e., less than 1/5 of the total cost for the former and more than 4/5 for the latter, be predicted for another project. Too many variables determine the total cost and the relationship of each separate cost to the total to warrant any such conclusions.

In Sunnyside Gardens the whole project was completed within the brief period 1924 through 1928. Because of

plumbing and fewer partitions are needed for stores than for apartments, the influence of the stores in the rental buildings was to reduce slightly per-room costs.

⁴⁵ The 14 stores included in the rental buildings have a space equivalent to 44 apartment rooms or an average space of approximately 3 rooms per store. Since less

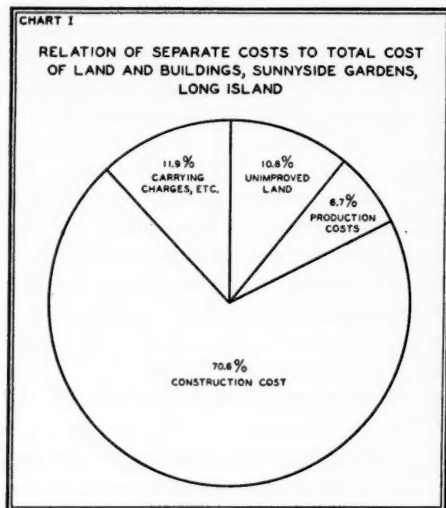
this circumstance production costs of land and carrying charges during construction were relatively low. Had the period necessarily been extended these costs would have increased and would probably therefore have formed a much larger part than 17.5% of the total cost.

The brevity of the period in which the Sunnyside project was finished was

of dwelling under construction is unfavorable, the operator may find it essential to build his project in scattered segments. In such a case, carrying charges of buildings mount rapidly. If in addition public improvements have been built in anticipation of a demand which does not materialize, from the aspect of the developer they too represent burdensome costs. As a result, production costs of urban land become high and these added to carrying charges may produce the much too common deficit experienced in the housing field.

However, assuming the existence of an effective demand for the utilities which are being produced, a study of costs in Sunnyside Gardens yields certain definite, general facts which are applicable to any housing undertaking. Land costs should be relatively low in relation to total cost of the project. This result may be obtained both through the purchase of inexpensive, unimproved land and through low production costs of land. A careful analysis must be made of the type and character of the unimproved site. Purchase of an area at a low price is not economy if high production costs are required to make it ready for urban use.

Since building costs are by far the greater part of the total cost of the project, economies in construction costs and low carrying charges are of importance. Here savings are largely the result of good management, becoming effective through careful purchasing and planning of the use of materials. At Sunnyside Gardens this took the form of a systematic plan of development wherein a whole unit of both public and building improvements was undertaken and marketed before another unit was begun. Such a procedure resulted in small production costs of land, economies in building construction, and low carrying charges during construction.



partly the result of good management and partly of fortuitous circumstances. Good management, although somewhat scarce, can be obtained. It is quite possible, however, that since the members of the Board of Directors and the officers of the City Housing Corporation serve without compensation because of the semi-philanthropic character of the organization, the cost of similar management to the average corporation would be considerably greater.

Fortuitous circumstances may be favorable or otherwise. In the case of Sunnyside Gardens a post-war demand for good housing and simultaneously rapid increments in land values largely contributed to the success of the project.

In contrast, if the market for the type

Some Uses of Holding Corporations

By KENNETH FIELD

HOLDING corporations, particularly public utility and railroad holding corporations, are becoming topics of general discussion. They are lauded and assaulted in political forums, magazines, and newspapers. Much of this discussion reveals a lack of understanding, not only of the meaning of terms, but of the functions of these vehicles of finance. Therefore, the purpose of this paper is to set forth the more important terminology and functions of holding corporations. For the most part, discussion is limited to public utility holding corporations.

Terminology

Holding corporations, or "holding companies" as they are commonly called in the United States, are corporations which are empowered to own securities of other corporations. This power, like other corporate powers, must be definitely granted by the state in which the companies are incorporated. The grant may be made to all corporations organized under the statute, as in Maine;¹ or it may be restricted to such corporations as include the power to hold securities among their charter provisions, as in New York.² Usually in granting the privilege of holding securities of other corporations, corporation laws make no distinction between types of securities. Thus the New York law³ gives the right "to purchase, acquire, hold and dispose of the stocks, bonds and other evidences of indebtedness of any corporation, domestic or foreign." In some cases, however, provisions deal specifically with the holding of stock. The Vermont law⁴ is so framed.

The latter type of provision reflects the fact that the privilege of holding the voting stocks of other corporations is of greatest economic significance and has attracted the most discussion and investigation. On this account, some writers prefer to restrict the term *holding corporation* to those corporations which hold voting stocks of other corporations. This attempt to narrow the meaning of the term is well taken. But since the right to hold all types of securities is essential to the proper performance even of control company functions, it would seem preferable to use the term in its broad significance; that is, the holding of securities in general. If the term is so used, special meanings can be covered by special terms.

Special Terminology. Special terms bearing upon holding company structure and operation are very numerous. A classified list of the more important terms would include the following: with reference to asset structure and nature of business—pure, mixed, trading, and non-trading holding companies; with reference to intercorporate structure—primary, top, system, intermediary, sub-, subsidiary, and subordinate holding companies; with reference to nature of control exercised—control companies and investment trusts; with reference to the origin of subsidiaries—parent companies and consolidated holding companies; with reference to the nature of service functions performed—management, financeering (financing, finance), and investment companies; with

² Stock Corporation law, § 18.

³ *Ibid.*

⁴ General Corporation Laws 1923, §§ 4924 and 4925.

¹ Maine Rev. Stat. 1930, c. 56, § 21.

reference to the industry in which major interests are held—railroad, public utility, industrial, oil, manufacturing, transportation, etc., holding companies.

These terms require definition. "Pure holding companies" are those whose only business is that of holding securities of other corporations. Hence, no operating properties are found among their assets. "Mixed holding corporations" conduct other business as well as that of holding securities; their assets include both operating properties and securities of other companies. "Non-trading holding companies" and "trading holding companies" are terms used mainly in England to designate "pure" and "mixed" holding companies respectively.

"Primary holding company," "top holding company," and "system holding company" designate that holding company which constitutes the single head of a system of subsidiary companies; sometimes the term "primary control company" is used in the same significance. "Intermediary holding company," "intermediate holding company," "sub-holding company," "subsidiary holding company," and "subordinate holding company" refer to those holding companies which are in turn controlled by other holding companies. The terms "intermediary control company" and "intermediary holding company" are used in the same significance.

"Control companies" are holding companies which control the policies of other companies through ownership of the voting stocks of the latter. "Investment trust" is a loose expression which is used to designate several types of securities-owning organizations, but the majority of investment trusts are organized as securities holding companies. The difference between control companies and investment trusts lies in the fact that the latter do not seek to control

companies in which they make investments as do the former. In theory, such companies diversify risks of management as well as risks of changing economic conditions. However, when a single financial interest organizes several investment trusts, it is possible to concentrate financial control under one management even though no single corporation owns such control. In fact, this has been the result in some cases. Under these circumstances the investment trust is a convenient device for befogging the ownership of control.

"Consolidated holding companies" are holding companies which have been formed to unify the control of existing corporations. "Parent companies" are holding corporations which have caused subsidiaries to be organized.

"Management holding companies" actively administer the affairs of their subsidiaries. Administrative supervision is usually made effective by placing holding company officers in key positions in the subsidiary companies. "Finance companies," "financing companies," and "financeering companies" are holding companies engaged primarily in aiding subsidiary companies to finance extensions, acquisitions, etc. "Investment companies" are holding companies which serve primarily as agencies for profitable investment; they usually limit their administrative supervision and financing activities to a much greater extent than do the other types of holding companies. The term "investment company" is also used, particularly in England, to designate those securities-holding corporations which are loosely called "investment trusts."

A "railroad holding company" is a holding company engaged chiefly in controlling operating railroad companies. Likewise, the terms "public utility holding company," "oil holding company,"

etc., indicate that the bulk of the earnings of the system is derived from public utility companies, oil companies, etc., as the case may be. Thus when holding companies control operating companies in several industries, it is customary to designate them according to the industry from which they receive the major portion of their income. However, this method is not followed exclusively. Thus Cities Service Company is sometimes designated as an "oil holding company" and sometimes as a "public utility holding company," though it has derived the major portion of its revenues from oil companies for long periods.

Several terms are also used to designate the underlying companies in holding company systems. The most common of these are: controlled company, subsidiary, and proprietary company. Those companies which are controlled by holding companies are known as "controlled companies" or "subsidiaries." In case the holding company owns all the stock of the controlled company, the subsidiary is known as a "proprietary company."

Consolidation by Stock Control

Foremost among the functions of the holding company is that of uniting properties which must be owned by separate corporations. In connection with this function a large number of the advantages of the holding company device arise. To see the nature of these advantages, one must examine the factors which make necessary the use of several separate corporations to conduct parts of a single business. Were there no need to preserve separate corporate entities, the function of articulating the properties into a unit could be performed by a single corporation owning the properties directly; and this use of the holding com-

pany would be eliminated. The inability of direct ownership of properties to exist profitably under present conditions gives rise to the function of uniting those properties by stock control of separate corporate entities.

The factors which cause parts of consolidated businesses to be conducted under separate corporate organizations are numerous and technical. Some of these considerations are quite substantial factors in themselves; others are of importance chiefly when operating in conjunction with still other factors. The influence of a particular factor will depend very largely upon the circumstances of the individual case; but in spite of the necessity for analyzing individual cases, certain causes of separate incorporation of parts of unified businesses stand out rather definitely. A summary of these causes includes: segregation of regulated from unregulated businesses; conformance to regulatory jurisdictions; evasion of restrictions placed on kinds of business conducted by single corporations; segregation of businesses with different risk factors; evasion of discriminatory foreign corporation laws, of after-acquired clauses, of debenture covenants, of financing and franchise obstacles to consolidation by direct ownership of properties; facilitation of procuring profitable service fees; betterment of public relations; retention of executives after consolidation; and a group of other objects which may be designated as "miscellaneous."

Segregation of Regulated Businesses. Though economic reasons have combined to bring many types of businesses under common financial control, the public attitude toward all types has not been the same. Thus public utilities have been subjected to inquisitorial procedures and a measure of social control unknown to competitive business.

Although industrials have been left more or less free from regulation, except for some non-inquisitorial prohibitions, public utilities have been subjected to positive regulation. In a large number of states this regulation reaches to a scrutiny and control of the quality of service, rates, accounting records, issuance of securities, and various lesser factors lying at the very heart of corporate policy.

The effect of this difference in social attitude toward public utilities has caused regulated businesses to be conducted by corporations separate and distinct from those conducting non-regulated businesses. In some cases this segregation has been required by law in order to make control by regulatory commissions more effective. In other cases, segregation has been resorted to voluntarily as a means of putting the details of non-regulated business beyond the scrutiny of public commissions. The latter motive has probably been more effective in shaping holding company structure than have legal requirements; for, whatever may be the social merits of regulation, business men generally have a profound dislike for governmental interference in the affairs and policies of their corporations. Such voluntary segregation would not seem necessary for regulatory reasons except for the fact that commissions have been given wide inquisitorial powers over non-public utility activities of public utility corporations. The very broad nature of these powers is aptly illustrated by the following excerpt from Chapter 160 of the Code of Virginia, 1919 revision:

"Sec. 4070. The State Corporation Commission, with or without an investigation, may require any public utility to furnish to it in such form, at such times, and in such detail as the commission shall require, such

accounts, reports and other information of whatsoever kind or character as it may deem proper and in such form and detail as it may prescribe, in order to show completely the entire operation of the public utility in furnishing the unit of its product or service to the public."

The best way of avoiding commission inquisition of this sort is to have separate corporations conduct the different types of businesses.

Conformance to Regulatory Jurisdictions. Conformance to regulatory jurisdictions has been motivated in part by a desire to avoid coming under federal jurisdiction as an interstate business and in part by the desire or necessity of meeting specific state problems. Generally, both private interests and state commissions oppose federal regulation of public utilities. The private interests believe that federal regulation would prove too rigid and too little amenable to their desires, whereas state commissions fear federal encroachment.

Apart from their fear of federal encroachment, state commissions feel that most regulation of local public services must be intrastate regulation and that they can make that regulation effective only if the operating corporations are organized under the laws of the state which is regulating them. Many state legislatures have taken the view of the state commissions. Hence, a number of states, e. g., Illinois, require all corporations operating specified public utilities within the state to be domestically incorporated.⁵ In addition to compulsory statutes of this type, many legislatures have passed statutes which indirectly compel domestic incorporation of domestic public utilities. Thus because of "statutory requirements,"⁶ the Indiana Bell Telephone Company was incorporated in 1920 to acquire the Central

⁵ Cahill Rev. Stat. 1927, c. 111A, ¶ 43.

⁶ Poor's and Moody's *Public Utilities Manuals*, 1921, p. 1160.

Union and other Bell system property which was located in the State of Indiana.

However, in the absence of statutory compulsion, there has been a tendency to conform corporate structure to state lines. As early as 1912, the Public Service Corporation of New Jersey adopted the definite policy of confining its activities to one state.⁷

"The activities of the Corporation are now wholly confined within the state of New Jersey, except so far as the operation of the Port Richmond & Bergen Point Ferry Co. and the Riverside & Fort Lee Ferry Co. are concerned. It is the intention of the management not to further extend the activities of the Company beyond the State line."

More recently (August 17, 1927), the *Financial World* reported with reference to the consolidation of the New York Telephone Company in New Jersey and the Atlantic Telephone & Telegraph Company that "the principal purpose of the merger is to eliminate the confusion resulting from the operation of an interstate business."

Of late years the intent to conform to regulatory jurisdictions has become more prominent. Thus President R. P. Stevens of the old Republic Railway and Light Company stated, after consolidation of a system of 64 companies into a system of 26, that

"the only barrier to further simplification is the division of the operations between electric, railway, steam-heating, coal mining ownership and similar departmental operations, plus the fact that *the properties, while geographically a single operating unit, are under the jurisdiction of two separate state commissions.*"⁸

Further in announcing the formation of the United Corporation by the Morgan interests, the *New York Times* of January 11, 1929, states:

"The general plan, it is understood, will be to shape the growth of public utilities along state lines, so that operations of an individual company will be restricted to a relationship with the Public Service Commission of its State alone."

Circumventing Restrictions on the Purposes of Incorporation. Statutes usually specify in considerable detail the purpose for which corporations may be organized; and they also usually limit the number and variety of purposes for which a single corporation may be organized. Thus Pennsylvania restricts a corporation to only one of the purposes specified in the clauses of section 2 of the Act of 1874.

Such close confinement of corporate activities frequently interferes with the formation of well rounded business units because a single corporation cannot conduct all related activities. The very rigid obstruction which some of these laws offer to the rounding out of properties may be illustrated by the case of the York Haven Water & Power Company of Pennsylvania. This company was originally chartered to supply water and water power in the Borough of York Haven, Pennsylvania. Later, in 1895, the Legislature passed an act giving it the right to manufacture and distribute electricity.⁹ Thus the company had the right to supply both water and electricity, although it never exercised its right to supply water. Some years later the General Gas and Electric Corporation secured control of the York Haven Company and attempted to merge it with the Metropolitan Edison Company, an electric power and light company. However, the Public Service Commission refused to permit the merger because the York Haven Company had the right to supply water.¹⁰ After more than

⁷ Moody's *Public Utilities Manual*, 1913, p. 3920.

⁸ The italics are mine.

⁹ 88 *Electrical World* 1911 (December 4, 1926).

¹⁰ *Ibid.*

two years of proceedings the Supreme Court of Pennsylvania permitted the merger on condition that the York Haven Company surrender its power to supply water.¹¹ Had the Company been exercising this power, that fact would have effectively prevented the merger.

In case the statutes forbid amalgamation or merger of corporations exercising different corporate powers, the holding company device can be used to consolidate them by stock control; thus difficulties such as those just cited can be avoided.

Evasion of Discriminatory Foreign Corporation Laws. State laws frequently discriminate between domestic and foreign corporations. As already indicated, certain types of businesses may be conducted only by domestic corporations. Aside from direct prohibitions of this nature, statutes offer many lesser obstacles to foreign corporations. Two of the more important of these are heavier taxation and the necessity of making burdensome reports. The matter of discriminatory taxation is familiar to students of this subject, but few have stressed the extent of burdensome reporting. Space will not permit a detailed statement of the nature of the required reports; however, an illustration of the requirements with reference to the one item of real estate will indicate the burdensomeness of some reports.¹²

"About one-third of the States demand of foreign corporations in the annual report a detailed schedule of real estate acquired and disposed of during the preceding twelve months. Occasionally this is supplemented by requiring a complete inventory of all real estate holdings at the close of the year."

When the tax and report requirements for foreign corporations are heavier than those imposed upon domestic corpora-

tions, the formation of a domestic subsidiary is an obvious means of escape.

Another factor is the effect of restrictions on the use of public highways and on the power to condemn property. Many states grant franchises to operate upon the public highways only to domestic corporations; many of the remaining states make the provisions of these special franchises so burdensome to foreign corporations that they find domestic incorporation desirable. Moreover, practically all local utilities must, at one time or another, condemn property. This is especially true of electric, gas, and telephone companies in which growth has been rapid. Therefore, since in most, if not all, states no corporation foreign to that state can exercise the power of condemnation, this factor is a strong inducement to domestic incorporation.

When any of the factors here noted cause domestic incorporation of properties lying in two or more states, effective consolidation of those properties may be obtained by means of the holding corporation device.

Segregation of Business Risks. As previously noted, public utility systems have branched out into a variety of types of business. Each of these businesses has characteristics of its own and is subjected to risks peculiar to it. Hence, the securities of a corporation having interests in several types of businesses necessarily represent a variety of risks, which frequently tend to make the sale of those securities more difficult. For example, the electric railway industry has very poor credit while the electric power and light industry has very good credit. If these risks are

¹² H. A. Haring, *Corporations Doing Business in Other States*. (New York: The Ronald Press Company, 1927), p. 73.

¹¹ *Ibid.*

combined in a single security, the cost of securing money, even for purely electric power purposes, is thereby increased. This general statement holds true not only when a single security represents electric railway and electric power and light risks, but also when a single security represents natural gas and/or oil risks and electric power risks.

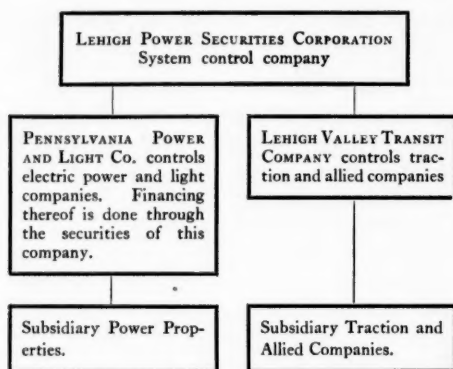
The problem of economically financing these different classes of risks has engaged the attention of public utility executives in recent years; it has usually been solved by employing the holding company device. The procedure may be outlined as follows. In all cases the first step in separately financing different types of service is to segregate the various types of service properties into separate operating companies. After this segregation, the usual method is to readjust the stock control relationships of the system so that corporations rendering the same type of service are formed into sub-systems under the control of sub-holding corporations. Securities are then issued by the sub-holding companies and by the subsidiary operating companies. Thus securities representing a single type of risk or similar risks are made available. This method of organization is illustrated by the stock control relationships of the Lehigh Power Securities Corporation, the Public Service Corporation of New Jersey, and the Cities Service Company.

When the stock control relationships of the Lehigh Power Securities Corporation were reorganized in 1920, all electric light and power properties of that system were united under the Pennsylvania Power and Light Company and all traction, bridge, and amusement park companies were placed under the Lehigh Valley Transit Company. After this reorganization, practically all financing was done through the Pennsylvania

Power and Light Company, and very little through the Lehigh Power Securities Corporation.

The same method of financing has been used by Public Service Corporation of New Jersey since 1924. At that time the Public Service Electric and Gas Company was formed to acquire all electric power and light and gas properties controlled by Public Service Corporation of New Jersey, whereas the electric railway companies were left under the Public Service Railway Company and the bus companies under Public Service Transportation Company. Since this reorganization took place, the electric and gas properties have been financed chiefly through Public Service Electric and Gas Company.

In the case of Cities Service Company, the chief difficulties in financing arose from the presence of risks in natural gas and oil properties. However, the method of segregating risks was the same. In 1924, Cities Service Power and Light Company was organized for the purpose of grouping the public utility properties under one company. At this time it was announced that future financing of the public utility companies would be undertaken through the Cities Service Power and Light Company. Later, the natural gas properties were separated from the oil properties by placing them under a new corporation, namely, Cities Service Gas Company. In this way each class of enterprises could be financed more nearly on its own merits because the investor in the securities of each sub-holding company had a claim upon the earnings of the enterprises grouped under that sub-holding company before those earnings were merged with the earnings of other companies controlled by Cities Service Company. The diagram on the next page illustrates the Lehigh Power holding company structures.



Evasion of After-acquired Clauses. The holding corporation device has long been used to evade the effects of after-acquired clauses¹³ in closed mortgages. The circumstances are usually as follows: An operating company has been financed by an issue of bonds secured by a closed mortgage containing an after-acquired clause. Growth requirements necessitate additional facilities, but these cannot be financed by first mortgage bonds because of the after-acquired clause in the existing closed mortgage. To avoid the necessity of financing by means of a junior mortgage, the operating company, or the holding company controlling the operating company, causes a new company to be organized to build the facilities. The new company issues its own first mortgage bonds to the public and its common stock to the company which has caused its incorporation. Because they are owned by a separate corporation, the new properties do not fall under the after-acquired clause of the parent company's mortgage; but inasmuch as the parent company holds control of the new corporation, the facilities can be devoted to the purposes of the system. After the facilities are completed, it is

¹³ This clause provides that in addition to the property originally pledged under the mortgage, all property subsequently acquired during the life of the mortgage

not unusual to merge the new corporation into the old, thus eliminating a now unnecessary corporate entity. This procedure is feasible because after-acquired clauses can affect only the equity of the parent company in the new facilities; and if the process is that of amalgamation rather than of merger, the liens of all the former corporations are closed.

The device of building new properties in the name of subsidiaries has been frequently used in connection with construction of electric generating stations. Because of their compact nature and financial importance, these facilities lend themselves more readily to subsidiary company financing than do the relatively smaller extensions of distributing facilities scattered in different parts of a service area.

Evasion of Debenture Covenants. The use of the holding company device to evade debenture covenants is similar to its use in evading after-acquired clauses. The chief difference lies in the nature of the covenants being evaded, although the legality of some of the methods is not so well clarified. Use of the device arises in connection with those debenture covenants which stipulate that the debentures shall be secured ratably if any of the corporation's property is subsequently mortgaged. To avoid such restrictions the corporation may acquire new property in the name of a subsidiary. The subsidiary finances the transaction by placing a mortgage on the property. The corporation may also convey some of its existing property to a subsidiary which then raises additional funds by placing a mortgage upon it. Needless to say, the opportunities for fraud are great in this class of cases, and the legality of the procedure will

shall come under it as additional security to the bondholders. Thus new property does not become an unencumbered basis for securing new credit.

depend largely on the circumstances which surround the individual case.

The managers of the corporation desire to avoid giving the debenture holders a lien because the absence of liens strengthens the current borrowing power of the corporation. This result follows because in the absence of prior liens, the current creditors stand on equal footing with the debenture holders. In many cases their position is stronger since they can reduce claims to judgments before default on debentures has given debenture holders a cause for action. Hence, the absence of the lien makes it easier for the corporation to obtain short-term accommodations.

Evasion of Financing and Franchise Obstacles to Consolidation. The holding company device is used to effect consolidations when financing or franchise obstacles prevent consolidation by direct ownership of the properties. Financing obstacles are usually the result of outstanding indebtedness. Provisions in bond issues often make the redemption of outstanding bonds necessary in case direct property-owning consolidations are formed.

"This is true in the case of the Pennsylvania Edison Company and the Metropolitan Edison Company, where the provisions of the mortgage of the former necessitate, in case of merger, the retirement of the entire issue of its bonds at an expense which would offset any advantage to be gained by financially uniting the two."¹⁴

In other cases, redemption is required in order to release securities pledged under a collateral trust bond or note issue. When an impending bond issue is not callable, a very great obstacle arises, since the bondholders are in a position to demand their own terms. Employment of the holding corporation device is an obvious solution for such problems.

Charter and franchise obstacles to consolidation by direct ownership of properties arise principally because of changed corporation laws. Many charters granting valuable privileges and exemptions are in existence today, which a present-day legislature would be unwilling or powerless to re-enact. Corporations possessing these valuable charters are unlikely, therefore, to enter into direct property-owning consolidations which would remove some or all of these privileges. In other cases, perpetual franchises exist, which would give place to less desirable franchises if the old corporations were to lose their identities. Another occasional obstacle is the inability of a company, because of franchise limitations, to operate in territories held by other companies. In such cases, the only avenue of consolidation is through control of corporations.

Facilitation of Profitable Service Fees. Under the present theory of public utility regulation, operating companies are allowed to derive gross revenues sufficient to cover: (1) operating expenses at reasonable cost, (2) taxes at actual cost, (3) depreciation, and (4) a fair return on the fair value of the properties used and useful in the public service. Service fees enter the computation in two ways: those connected with operating management inflate the operating expenses; those connected with construction inflate the valuation on which a fair return is computed. Fees connected with financing enter the computations in one or the other of the two preceding ways, depending on the circumstances. In some cases they are charged against current operating expenses; in others they are capitalized.

Holding company relationships affect the situation in the following way: If the services are rendered by the staff of the operating company, the actual

¹⁴ 88 *Electrical World* 1191 (December 4, 1926).

reasonable cost of those services alone is allowed in fixing rates. However, if the services are rendered by another corporation, they may be charged into the accounts of the operating company at an amount which includes a profit to the service organization. To be sure, the fees may have to be defended, but as yet regulatory control has not developed to a point where adequate restrictions have always been enforced. Hence, the holding company device offers an advantage in collecting profitable fees under the present state of regulation.

Betterment of Public Relations. In recent years, public utility interests have devoted much attention to fostering better public relations. Beside developing improved service and employee courtesy, they have attempted to bring influential persons in line by judicious placements of securities and elections to directorates. In this last connection local subsidiaries lend themselves readily to public relations work, for each subsidiary has numerous offices to be filled. By careful distribution of directorships and high-sounding official titles much criticism of absentee control can be avoided. Though this motive for maintaining a federated system structure has been important in the past, it is ordinarily overweighed by other factors at present.

Retention of Executives after Consolidation. The holding corporation device makes it possible for presidents, vice presidents, and other officers of previously independent companies to retain their titles and positions in a consolidated enterprise. The problem of titles and positions for influential executives of the constituent companies is always a difficult one for promoters of consolidations. The new organization must work harmoniously to be successful; yet ambitions and jealousies of executives are

always present. Hence, to the extent that the prestige of old positions can be left undisturbed, to that extent the problems of consolidated efficiency are simplified. The advantages to be gained by permitting officers and managers of constituents to retain their old titles were given by Judge Gary as one reason why the United States Steel Corporation was organized as a holding corporation rather than as a direct property-owning consolidation. While this advantage is not a controlling factor in keeping separate corporate entities alive in public utility industries, it is a contributing factor which must be weighed in any plan of consolidation. Able management groups now make much use of employee titles as a device for developing a better *esprit de corps*, but the titles are for the most part departmental rather than corporate.

Miscellaneous Uses. The holding company device is also used to serve a variety of minor purposes, such as facilitation of profit sharing, experimentation, manipulation, and concealment of identity. Subsidiaries to facilitate profit sharing have developed chiefly among non-regulated companies. They are exemplified by the Managers Securities Company in the General Motors group. Bell Telephone Laboratories, Incorporated, is one of the foremost experimental and research institutions in the country. From the standpoint of manipulation, it may be observed that holding companies in the public utility field sometimes serve as vehicles through which excessive amounts of securities may be unloaded on the public for the profit of the promoting interests. However, there has been less exploitation of the public than might have been expected considering the rapid growth of some public utility industries. Subsidiaries to conceal identity have been

used both as predatory instruments and as legitimate vehicles for carrying on system business. As predatory institutions they have developed chiefly as fighting subsidiaries of industrial corporations. As legitimate business vehicles, they have many uses; an example in point is the sale of repossessed electrical appliances when the parent company does not care to be known as a merchandiser of second hand goods.

Facilitation of Consolidations by Direct Ownership of Properties

The amalgamation or merger of two or more corporations or the sale of the total assets of one corporation to another is fraught with many obstacles. Corporate officers of the constituent companies may block the consolidation plans in order to avoid becoming subordinate officials of the larger corporations, or minority stockholders may hold up ratification under conditions which amount to little short of blackmail. Then too, the attempt to negotiate comparative values for the separate corporations may also precipitate frictions which will permanently end any attempt to bring the properties together. Finally, unless the affairs of the constituent corporations are placed under a single dictatorship, the difficulties incident to bringing about their fusion may require a long period of years.

The holding corporation helps solve all these difficulties. The procedure is as follows: First, holding corporation securities can be sold to raise funds. Then, control of the companies to be fused can be acquired in the open market and by private negotiation. The controlling stocks can be paid for in cash, or by an exchange for holding corporation securities. After having obtained complete domination of the constituent companies, the holding corpora-

tion can work out the problems of consolidation with a minimum of friction and delay. Then, if the holding company is merely the vehicle for effecting the consolidation, it can be fused with the constituent operating companies when they are finally amalgamated.

Experimental Consolidation

A substantial proportion of the consolidations of the past have failed to meet the expectations of their promoters. Other consolidations have failed to prove so socially desirable as they were considered to be by the regulatory commissions that authorized them. The reasons for this situation have been varied and numerous. It is a matter of little wonderment that, in undertakings of such great complexity, important factors should have been overlooked. None the less, both investors and the public need to be safeguarded against the losses of consolidations. Such losses cannot be entirely eliminated, but they can be substantially minimized by employment of the holding corporation device. If the consolidation is worked out first by bringing the constituent corporations under unified stock control, future fusion or dismemberment can take place with a minimum of friction and loss. On the other hand, if the constituents are fused into a single corporation at the outset the unscrambling process is extremely difficult, if not impossible. In order to protect themselves against loss, promoters use stock control as a provisional consolidation device. To protect the public in like situations, it might be well for regulatory commissions to require likewise that consolidations be limited to stock control until their social desirability is amply demonstrated.

Dismemberment of Corporate Businesses

Frequently, the holding company is used as a temporary device in segregating

the parts of a corporate enterprise. The procedure giving rise to holding corporation relationships includes: first, formation of a new corporation to take over a portion of an existing business; then that portion of the properties designed for segregation is transferred to the new corporation; and the parent corporation takes in exchange for its properties, the securities of the new corporation.

If, however, the segregation is to result in a complete disunion of the properties, the stock of the new corporation is either distributed to the stockholders of the original corporation or is transferred to other interests.

A good illustration is the dismemberment of the Commonwealth Power, Railway and Light Company during the period 1922-1924. The Commonwealth Power Corporation was organized in 1922 to assume control of the electric light and power companies of the Commonwealth Power, Railway and Light Company. In 1924, the Electric Railway Securities Corporation was formed to assume control of the traction companies of the same holding corporation. After these sub-holding companies had been formed, they delivered their securities to the Commonwealth Power, Railway and Light Company in exchange for stocks of the various operating companies which they were to control. Then Commonwealth Power, Railway and Light Company distributed the common stocks of the Commonwealth Power Corporation and of the Electric Railway Securities Corporation to its stockholders and dissolved its own corporate existence. Thus the traction properties and the electric power properties were placed in separate holding corporation systems.

The Financing Function

Public utility holding companies fre-

quently play the role of financing companies, providing the funds for subsidiaries to extend their properties and purchase additional equipment. The method of operating as a financing company involves the accumulation of a large working capital through sale of securities or retention of earnings. Funds are then advanced for temporary periods to individual operating properties. These advances may be made on unsecured open account or in the form of loans secured by pledge of securities of the operating subsidiaries. When the advances have reached sizable proportions, the operating subsidiary brings out a bond issue or other security issue and uses the proceeds to repay the advances. The holding company then has funds with which to repeat the process.

This method of financing operating companies gives rise to several advantages and economies, though the benefit of the economies is not necessarily passed on to the operating companies. These advantages and economies may be listed under five heads: (1) avoidance of delay in authorizing the issue of new securities, (2) avoidance of piecemeal financing, (3) freedom in choosing the time of bringing out security issues, (4) better banking connections, and (5) better meeting of calamities.

The use of a finance company avoids delays in authorizing security issues in two ways. First, commissions of about half the states regulate the issue of securities. Hence, if an operating company were to finance its own extensions, it would be required to secure permission to issue the necessary securities. This procedure might result in considerable delay. However, under the finance company method, facilities are frequently extended first; then permission is secured to issue securities to reimburse

the holding company. The same advantage exists when it is necessary to secure stockholder ratification of a change in capitalization. The facilities may be purchased first and the change in capitalization ratified afterward. Ordinarily, though, the holding company would control enough of the voting stock of the subsidiary to secure ratification.

The holding company acting as a finance company avoids piecemeal financing on the part of subsidiaries by advancing small sums of money over considerable periods of time. In this way the subsidiaries are not obliged to bring out small issues of securities, but can wait until the advances are sufficiently large to warrant large issues, and thus very likely reduce financing costs.

A similar advantage comes from being able to fit the time of issuing securities to money market conditions. In an unfavorable money market temporary financing can be done through the holding company and the advances to subsidiaries be paid back later when conditions are more favorable. However, this method is not a device without limits, for the holding company is not in a position to extend advances indefinitely and in ever increasing amounts.

Likewise, the holding company usually has an advantage over the individual operating company in seeking investment banking and commercial banking services. This advantage follows chiefly from the fact that the holding company represents a whole system of companies, whereas the individual company stands alone. Hence, the size of the accounts represented gives the holding company greater bargaining strength than the smaller subsidiaries possess.

In time of calamity the borrowing power of the holding company is also a source of considerable economy in sub-

sidary company financing. Public utility companies are occasionally severely damaged by floods, tornadoes, earthquakes, fires, and the like. For the time being, their credit is greatly impaired. In some cases they are unable to obtain accommodation; in other cases the accommodation is exceedingly costly. At such times, since its credit is only slightly affected by the troubles of a single subsidiary, the holding company can still obtain funds on economical terms and can advance the funds necessary to put the operating company back on its feet. The rehabilitated subsidiary can issue its securities on better terms and repay the holding company.

The Assumption Function

The holding company acting as an assumption company issues its own securities against an assortment of securities of other companies. It was formerly customary to pledge the securities in the holding company's portfolio as security for collateral trust bond issues, but at present the tendency is to issue unsecured debentures of the assumption company. This change of policy gives greater latitude in substitutions of portfolio. Under the changed procedure, the assumption company assimilates the investment trust.

Assumption companies have been used chiefly as a means of marketing small security issues which have been taken in payment for services or equipment. For example, in the early history of the electric light and power industry, electric plants found it very difficult to sell their securities to the public. Therefore, in order to make sales of electrical equipment to the operating companies, the equipment manufacturers took their pay in securities of the local companies. This procedure tied up large amounts of working capital of the manufacturers,

and led to the necessity of finding some way of disposing of the securities. The assumption company proved a solution to the difficulty, since the public would buy a security based upon a diversified list of securities of local plants when it would not buy the individual securities of local plants. General Electric Company used this device when it caused the incorporation of Electrical Securities Corporation in 1904. The large engineering firms have also resorted to it, notably Stone and Webster, Inc. However, pure assumption companies are not now common in the public utility industries; the assumption function is performed along with many others by the system control companies.

Access to Foreign Money Markets

A use of the holding company which has attracted little attention is its employment to gain access to foreign money markets. The ordinary procedure is to incorporate a holding company in the country where funds are to be raised. This company then sells securities, the proceeds of which are used in developing properties in foreign lands. The advantage of this arrangement lies chiefly in the fact that the investor will accept a smaller return on domestic securities, other things being equal, than he will accept on foreign securities. In distinguishing domestic and foreign investments, the investor tends frequently to look to the place of incorporation rather than to the location of the underlying corporate properties. In some cases the investor considers that the domestic public utility holding corporation doing business in a foreign land is likely to be more profitable than a corporation doing a domestic business because of the absence of profits regulation in many foreign countries. Because of this attitude, he will frequently pay a high price for securities of the domestic holding

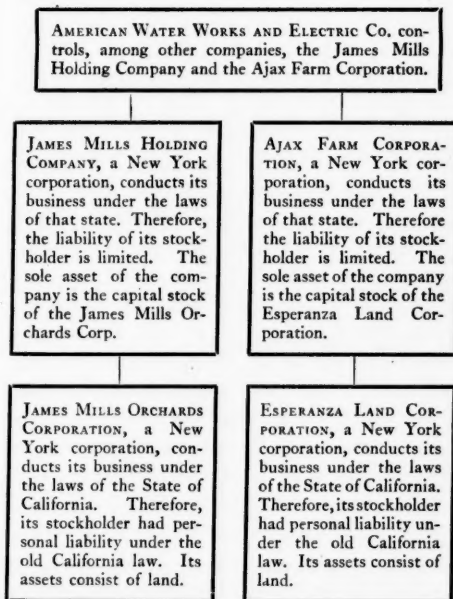
corporation controlling foreign properties, when he will pay only a low price for securities of a foreign company in essentially the same circumstances. This problem of foreign investment has been approached from a different angle by the investment trusts which invest in foreign securities, but in both cases capital for foreign employment has been secured in domestic markets on more favorable terms than had the foreign securities been sold direct.

Limitation of Liability

Limitation of liability of shareholders has been considered one of the chief advantages of the corporate form of business organization. The smaller the liability of the stockholder, the greater is the ease of raising funds. Yet the liability of shareholders in all types of corporations organized under all jurisdictions is not the same. Banking corporations are notorious for the fact that their shareholders frequently are liable, not only to loss of their entire investment, but also for an additional forced contribution equal to the par value of their shares—in Colorado, equal to twice the par value of their shares. Beside these exceptions to the general condition of single liability of stockholders, the laws of practically every state in the union hold the stockholder liable for unpaid installments.

In this connection the holding company is especially valuable, for in all cases in which legal liability is in excess of the amount actually paid in, use of a holding corporation will effectively limit the liability to the amount paid in, unless the intercorporate relationship is fraudulent or contains other legal defects. A holding corporation is organized under the laws of a state or nation which limits the liability attaching to the full-paid shares to the amount already contributed. The holding corporation then

acquires the stock of the corporation whose shares carry liability in excess of the amount already contributed and finances their purchase by selling its own securities to the public. The effect of this process is to make the holding corporation the real stockholder of the company whose shares carry additional liability. If, then, the holding company has no assets other than the stock of the single subsidiary, it will be impossible to enforce the additional liability attaching to those shares because no assets will be available to satisfy such liability. Since the shares of the holding corporation carry no further liability, it is impossible to go beyond the assets of the holding corporation.¹⁵ This device is illustrated by the accompanying diagram which shows the set-up used to evade the California laws as they existed prior to 1930.



Under this intercorporate structure the status of liability would have been as follows: In case either of the land

companies mentioned above went bankrupt and the creditors undertook to enforce the personal liability of the stockholders, the only asset upon which they could levy would be the capital stock of the bankrupt company. Since this stock would have become worthless before suit was brought against the stockholder, the interposition of a holding company would have effectively limited the liability of the American Water Works and Electric Company.

Liberalizing Capitalization

The regulatory commissions of more than half the states are empowered to regulate the capitalization of operating public utility companies. In most cases this power is invoked to prevent overcapitalization and /or overbonding of the properties. Such regulation has ordinarily been along conservative lines and has tended to prevent excessive thinning of ownership equities in the companies involved; therefore commissions have frequently prevented promoters from capitalizing properties as liberally as they desired. In order to circumvent such restrictions, promoters have resorted to the holding company device. Since holding companies are not subject to regulation, the promoters may organize a holding company to own the entire common stock of the operating company. They may then issue against this asset as large an amount of bonds, preferred stock, and common stock of the holding company as the public will buy. This principle applies in cases in which the holding company owns equities in several subsidiaries, but one may see it more clearly in those cases in which the

¹⁵ This device has been used for many years, but it has not yet been adequately tested in the courts. Recently the attorney general of Ohio ruled that "holders of certificates in fixed investment trusts may be subject to double liability on underlying securities of national banks." (*Wall Street Journal*, March 30, 1931, p. 6.)

holding company's equity is confined largely to a single company.

An example in point is the Southern California Gas Corporation case.¹⁶ In 1927, this corporation acquired the properties of several gas companies operating in California. The transaction was carried out by assuming the indebtedness of the acquired companies and by issuing stock in payment for the remaining equities. The California Railroad Commission approved the arrangement; but it approved the issue of common stock to the par value of only \$2,000,000, although the market value of the stock was reported to be \$10,000,000. It may be said, therefore, that the capitalization of the operating company was fairly conservative. However, as a part of this promotion, the Southern California Gas Corporation (of Delaware) was organized to own 99% of the common stock of the Southern California Gas Corporation (of California). The plan of capitalization of the Delaware corporation called for the issue of \$25,000,000 of collateral trust bonds, 200,000 shares of \$6.50 preferred stock, and 600,000 shares of common stock. At the completion of initial financing all were to be outstanding except 125,000 shares of the preferred stock. The bonds were secured by pledge of the common stock of the California company and the capital stock of the Ventura Fuel Company, a small company for which no financial statements are published in the investment manuals. From this recital, it is evident that the California operating properties become the basis of a very liberal capitalization. Although the Delaware corpora-

tion served purposes other than the mere liberalizing of security issue, that fact does not vitiate the validity of the illustration. Thus the holding company constitutes a legal device by which a larger face value of securities may be issued than regulatory commissions deem can be safely supported by the underlying properties.

Summary and Conclusions

This paper has set forth the terminology of holding corporations and has dealt with certain specified functions of holding companies to the extent that those functions are peculiar to securities-holding organizations. The functions thus recognized consist of: consolidating by stock control when other methods are less desirable or not available, facilitating the process of consolidating corporations by direct ownership of properties, effecting experimental consolidations, dismembering corporations, financing in avoidance of restrictions on securities issues, substituting securities as assumption companies, gaining access to foreign money markets, limiting the liability of stockholders, and liberalizing capitalization. No attention has been paid to the problems of interconnection as related to rail, telephone, telegraph, electric, and gas companies; nor has attention been paid to large-scale management, large-scale engineering, and large-scale financing because those advantages are available to all types of large-scale enterprises, whether holding company systems, or direct property-owning corporations, or leased systems. The author has treated these last mentioned subjects individually in other places.¹⁷

¹⁶ See Moody's *Public Utilities Supplement*, December, 1927, p. 82.

¹⁷ See: "Why the Electric Utilities Trend toward Group Management," 6 *Public Utilities Fortnightly* 86 (July 24, 1930); "The Substitution of Securities by Holding Companies," 6 *Ibid.* 222 (August 21, 1930); "Interconnection and Its Influence on the Formation of Systems of Electric Light and Power Companies,"

18 *University of Colorado Studies* 123 (April, 1931); "A Study of the Intercompany Structure of Service Corporations in the Electric Light and Power Industry," 5 *Journal of Land & Public Utility Economics* 293 (August, 1929); "Composite Public Utility Companies: Some Causes and Effects on Public Utility Holding Corporation Systems," 6 *Ibid.* 74 (February, 1930).

Cycles in Real Estate Activity*

By LEWIS A. MAVERICK

IN any field of production, activities close to the ultimate consumer in the chain of production display relatively less severe cyclical variations than do activities nearer the production of the raw material. For example, wholesale prices fluctuate more widely than retail prices and prices of industrial raw materials still more sharply. The question arises, does this same generalization hold true in the land market? If so, it is an important factor to be reckoned with by those operating in, or studying, real estate markets. In other words, how do the various measures of real estate activity, such as subdivisions, number of deeds, and value of property transferred, fluctuate? By analyzing the past performance of these indexes may we discover guides to economic activity in the field of real estate?

The purpose of the present article is to analyze real estate activity in San Francisco, California, and in Alameda County, which lies opposite San Francisco on the east shore of the Bay. The analysis will be made in terms of three series of data: number of subdivisions recorded, number of deeds filed, and value of property transferred. In each of these fields the fluctuations over a period of time present a composite of two cyclical movements: one of about 15 years' and the other of about three years' duration. The separation of these long-period and short-period swings and a determination of their relative importance in various real estate series is necessary to an understanding of the land market. For example, subdividing, or the manufacture of urban sites from

rural raw material, is marked by more pronounced fluctuations than is the number of deeds, which represents purchases (both from subdividers and from other owners) by the ultimate consumer. This fact is not always appreciated. Many undertake to subdivide without making allowance for the long-period swing and without realizing the length of time required for the round-about process of producing an urban site out of the raw subdivision and selling the lots. Thus, when the property is at last actively on sale, it is often found that the demand has gone, with no prospect of return for a number of years.

The first step, therefore, is to examine subdivision activity over a period of years, for this represents the initial stage in the production of urban sites. The next stage includes an analysis of data on number of deeds and on value of property transferred, which represent activity in both vacant and improved sites. If there is any difference in the behavior of these different series, this fact may be of some significance as a guide to economic activity in the urban land market.

The Subdivision Market

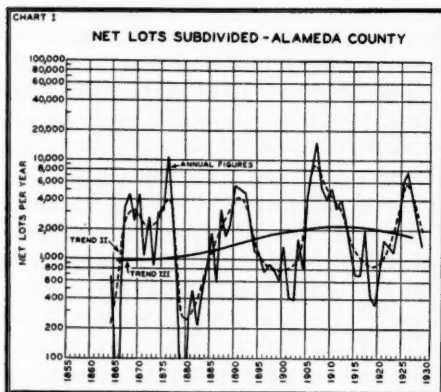
An examination was made of the subdivision maps recorded from 1853 to 1929 in Alameda County. The maps were examined in detail, lots and other units of area counted, and notation made of overlapping with previous subdivisions. The subdivisions were listed in chronological order by months, located precisely on the map of the County, and a table constructed, showing for each

San Francisco, California, 1853 to 1930," deposited in manuscript form in the library of the University of California, Berkeley.

* This article is based on a more extended study, "Activity in Real Estate in Alameda County and in

map (and the total for each month): gross count of lots, gross count of other areas (which for brevity were termed "blocks"), net count of lots, and net count of blocks.¹ The monthly figures displayed such great irregularity that they were assembled into yearly totals; this series for the entire County as a unit was analyzed for short- and long-swing movements. A second phase of the study of subdivisions was an examination of the different sizes of subdivisions, to determine whether large or small subdivisions were more sharply marked by cyclical fluctuations.

Chart I, which presents the net count of lots subdivided each year in Alameda

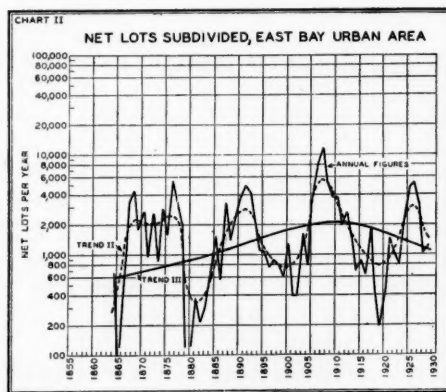


County, will illustrate the graphical method of separating long- and short-period fluctuations by successive smoothings² of the original annual data. The curve of original data is smoothed first by the line labeled Trend II which "eliminates" the short-run fluctuation; the short-run cycle is revealed in the relation of the actual yearly data to

¹ "Gross count" here means the raw or actual count from the map; "net count" is the remainder after previously existing lots (or blocks) in the same area have been subtracted.

² The statistical advantages of this procedure, giving a separation between long-swing and short-swing movements, will not be here elaborated; the reader is asked

Trend II but is no longer present in Trend II. Trend III, in turn, eliminates the longer fluctuation or "major" cycle; or the major cycle may be said to be revealed in the relation between Trend II and Trend III. In this instance, the major cycle in the real estate subdivision market is found to have a length of about 15 years and there is no trace of the rule-of-thumb, seven-year "business cycle." Trend III, which corresponds with the secular trend ordinarily secured, seems to have lost its upward turn in recent years and to have begun a downward sweep. It may be expected that as the County becomes more thoroughly urbanized, this trend will decline further. This expectation is confirmed by Chart II, which presents the subdivision data for the urban section of the County.³ This section is more thoroughly urbanized than is the County as a whole, and the greater decline in the trend is quite clearly visible.



In both these charts the fluctuations of Trend II about Trend III are quite

to accept the method without such exposition. The method is taken, with minor adaptations, from Ragnar Frisch, now at Yale University.

³ The contiguous cities of Alameda, Albany, Berkeley, Emeryville, Oakland, Piedmont, and San Leandro, in their present boundaries, were studied jointly, under the customary local title of the East Bay Cities.

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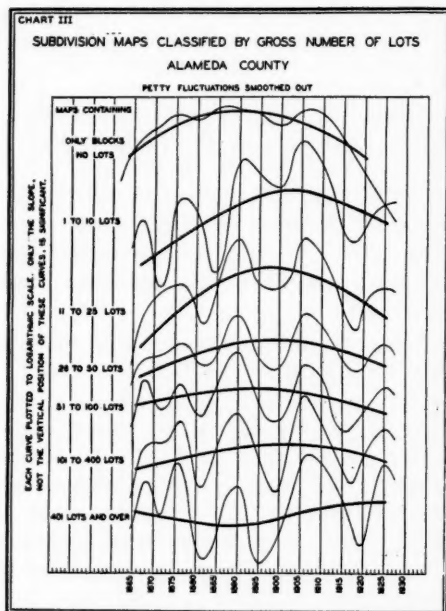
regular. Comparison with Charts VI, VII, and VIII reveals that subdivisions, number of deeds, and values all show major movements at the same times, but that the violence of the movements is great in subdivisions, intermediate in values, and relatively slight in number of deeds. This comparison of the three indexes confirms the common impression that subdivision activity is speculative to a high degree. Subdivision activity falls to a low ebb between periods of activity, more than 50% below the trend, and rises to a high point above the trend in periods of activity; only 1/10th as many lots are subdivided each year in periods of inactivity as during peak periods. In fact, if the comparison were made between actual maximum and minimum yearly figures, instead of the more moderate values read from the smoothing line, the disparity would be even more extreme.

A brief characterization of the several periods of activity and inactivity will throw additional light on real estate activity in Alameda County. The national panic of 1873 was accompanied by merely a minor recession in the California real estate boom. The transcontinental railroad had been completed in 1869. Immigration of non-miners was going on and disappointed miners were buying land and settling down in an agricultural or urban life. A peculiar confusion in the state taxation of land and mortgages occurred at this time and many men were refusing to pay what they termed double taxes; this served to focus interest upon real estate activity. In 1878 the new and "radical" State Constitution was ratified. The rise toward the peak of 1890 was national in scope, but local conditions accentuated it in California; these included the building of railroads in the State, the great boom in Los Angeles in 1887, and the locally important dredging

of the Oakland Harbor. The vigor of the movement in 1906 and 1907 is partly attributable to a fundamental activity which was national in scope and which is reflected in the San Francisco figures prior to April, 1906, but upon this substantial growth was superimposed a great inundation of new residents, who left San Francisco after the fire of April, 1906 to take up residence elsewhere as in Alameda County. The peak of 1925 and 1926 again reflects a national movement; the fact that it did not go very high may be attributed to the competition of Los Angeles. This period of activity was probably brought to an early end by the State epidemic of hoof and mouth disease and other rural factors, although undoubtedly the national recession from the great post-war spurt of real estate activity and building construction would soon have been felt.

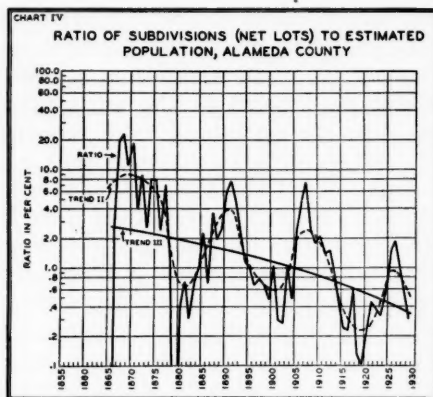
The irregular fluctuations of the actual annual figures in Charts I and II, which, as already noted, are in sharp contrast to the relatively regular, long-swing movements of Trend II about Trend III in both instances, suggest an examination of the influence of large subdivisions occurring at irregular intervals. Although the petty movement is not a valuable guide to subdivision policy, some indication of its nature is useful. Consequently, the second phase of the analysis of the subdivision market is concerned with discovering whether the fluctuations are stronger in urban subdivisions of large size than in the smaller projects. It must be concluded that the number of maps, classified according to size, which are filed annually in Alameda County, yield no evidence in support of this generalization (Chart III). The curves are strikingly similar save for the one representing rural subdivisions (these contain no lots at all but are

merely partitions of larger areas), which shows little fluctuation and a long decline from a peak about 1885. However, the number of maps filed in the rural class is small, and not much reliance may be placed on the shape of the corresponding curve. In contrast to this movement is a tendency toward large-scale production as indicated by the continued upward swing of the last curve on the chart.



The nature of the relation between the count of subdivisions and population is shown in two ways: in terms of gross population (Chart IV) and of annual increment in population (Chart V). The shape of Trend II is similar on the two charts. The ratio of net lots to total population has declined more rapidly

⁴ Only one major correction of the original data was necessary. For the early years of Alameda County, it was possible to obtain the deeds only by date of execution rather than by date of filing, and by number of grantors rather than by number of deeds; this necessitated correction to make the entire series homogeneous.



than has the ratio of net lots to population increment. Subdivisions are chiefly for new arrivals, and continue to serve the new arrivals at a relatively constant per-capita rate, though the new arrivals are declining in number relatively to the gross resident population.

The Retail Realty Market

A count was made of the deeds filed each month in Alameda County;⁴ and a similar figure for San Francisco City and County (a combined administrative unit) was taken from the publications of Thomas Magee and Sons of that City. The estimated gross value of parcels transferred was obtained for San Francisco from the same source. The latter

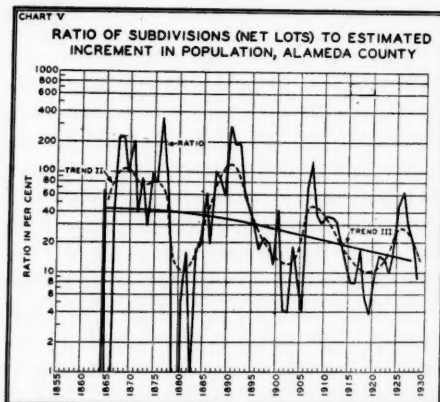
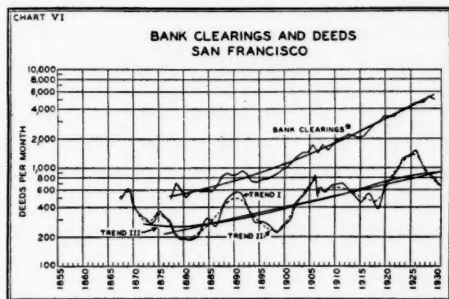


figure is unique, having been faithfully estimated each month since 1866, only three individuals having taken a hand in the estimates over the entire period.

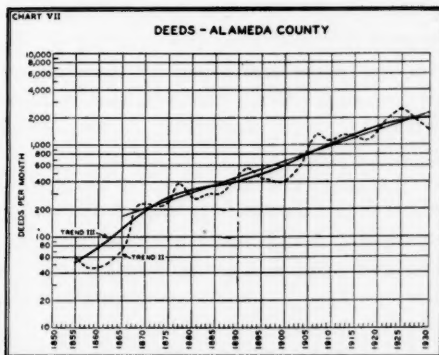


The monthly data were plotted on logarithmic paper, and Trend I on Chart VI was constructed, having much the character of a 12-months' moving average but chiefly distinguished from such an average by smoothness and freedom from sharp curves.⁵

On Chart VI, Trend I has removed the seasonal movements from the number of deeds filed in San Francisco and there is revealed in the relationship between Trend I and Trend II the short cycle of about 3-years' duration, and in the relationship between Trend II and Trend III the major cycle which has a 15-year period and is more significant in its amplitude than is the short cycle. The catastrophic effect of the fire upon the number of deeds in 1906 may be contrasted with its relatively smaller effect on general business as represented in bank clearings.

The analogous series for Alameda County differs from that for San Francisco most obviously in its behavior in 1906 (Chart VII). Though the earthquake was felt in both communities, only San Francisco suffered the fire; it

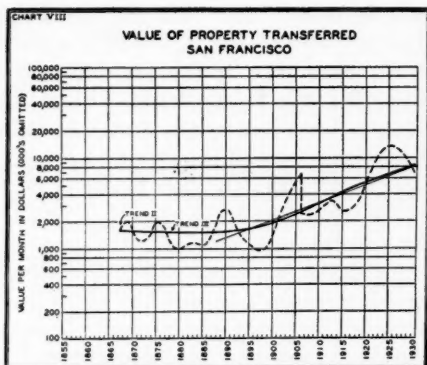
may be clearly seen that the San Francisco fire stimulated real estate activity in the East Bay at the expense of San Francisco. On both Charts VI and VII straight lines have been added to show the average rate of growth, and to make clear to the eye how close to the straight line of constant rate of growth Trend III lies. In fact, the displacement from the straight line in the two charts is of almost identical magnitude, and the dates when Trend III crosses the straight line are almost the same on the two charts. The slopes of the two straight lines, to be sure, are different; the community on the east shore of the Bay was, at the beginning of the period, much less populous than San Francisco, but has been growing at a greater rate. The timing of the major swings is the same in both cases, and corresponds to the movement in



subdivisions as shown on Charts I and II; it corresponds also, though not so closely, to the timing of the movement in San Francisco values (Chart VIII). Another inference from the behavior of these curves is that the real estate market is not so narrowly localized as many have been wont to assume. Activity in the central cities and the

⁵ In this article, Trend I with its detail is shown in only one chart, namely Chart VI, the number of deeds filed in San Francisco. Trend I is a continuous curve,

a smoothing of the monthly data, as contrasted with the curve of annual data on Chart I which is a series of short straight lines.



suburban areas seems to be closely related, at least as to long-time movements.

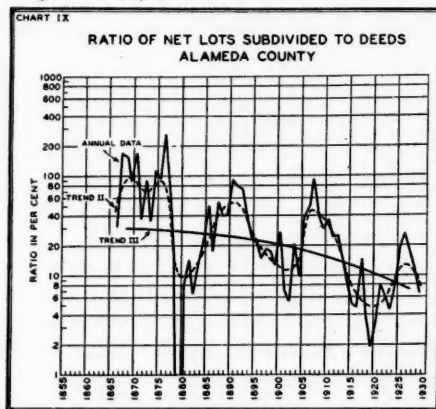
When the value of property transferred annually in San Francisco (Chart VIII) is compared with deeds recorded (Chart VI), the general character of the movement is found to be similar but accentuated. The gross value of the property transferred each month is a compound phenomenon, the product of the average price multiplied by the number of lots sold. Price tends to rise and fall with business activity; consequently the movements in gross value of property transferred show a wider amplitude than the movements in the simple count of deeds. A difference in detail between the two charts is evident following the fire in 1906. Transfers became relatively numerous soon after the fire, but for some years it was a panicky market with very low prices; values were slow to recover, finally showing a minor peak in 1912.

Relationship Between Series

A direct comparison between two of the variables is shown in Chart IX. The curve showing the ratio of subdivision activity to transfers in Alameda County substantiates the conclusions arrived at by inspection of the separate curves on subdivision activity (Chart I) and deeds or transfers (Chart VII). The high points are in 1876, 1890, 1907, and 1926,

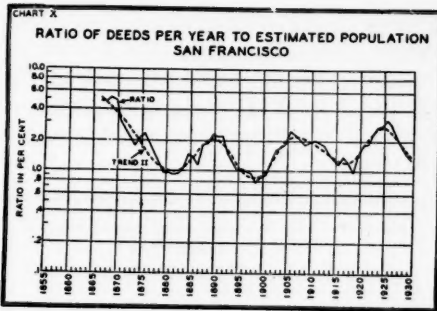
practically the same as in the original series. Even after the subdivision curve has been "deflated" by dividing by the number of transfers, the residual curve (Chart IX) is still much more violent than the original curve of transfers. This is striking evidence of the extent of the ebb and flow of subdivision activity.⁶

The short-time movements in number of deeds and in values in San Francisco were examined for correlation, but the coefficient obtained was so low as to be negligible. On the other hand, when the long-time (15-year) movements were ex-



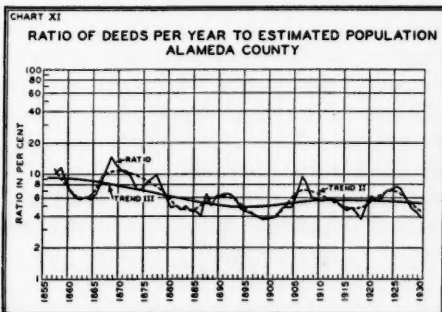
amined for correlation, a coefficient of .87 was obtained. It may be concluded that the basic movements in the two series correspond, but that the petty movements do not. Values are greatly affected by single large transactions, which have little effect on the number of deeds. These irregular movements disturb the correlation in the short-swing fluctuations; but in the long-swing movements such irregularities are smoothed out, and the underlying (moving) average of the values is compared to the similarly smoothed average of the deeds; the basic likeness in the series is

⁶ In mathematical terms, this curve suggests that subdivisions vary not merely as the square of the variations in transfers but as some higher power.



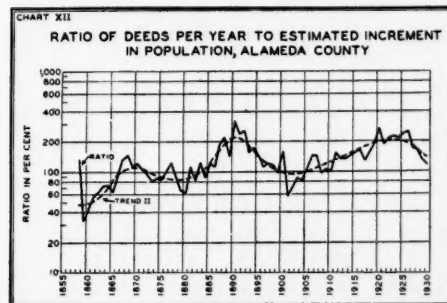
here brought out, freed from minor fluctuations. Another cause for failure to obtain correspondence in the short movements of the two series is that the values were largely estimates, and the estimator, although he was certainly competent and sincere, was necessarily unable to avoid making allowance for the "underlying" value, and consequently his estimated values were probably not so sensitive to rapid changes as the actual market values, if those could in any way have been determined.

The ratio of the annual count of deeds to estimated population is presented for San Francisco on Chart X, and for Alameda County on Chart XI. When the relative figures of Chart X are compared with the corresponding absolute figures (Chart VI), it is seen that the shock of the earthquake has been reduced in the "deflated" curve (Chart X), and the trend line flattened by the process of deflation. The deflation effected for



Alameda County (Chart XI) so influences the trend line that it takes on a declining instead of a rising slope. Speculative activity has been pronounced in Alameda County from early days, but it would appear that per capita speculation in land is decreasing. This tendency reflects the growing urban maturity of the region.

The ratio of deeds to estimated increment in population is presented for Alameda County only (Chart XII), and may be compared with the similarly deflated curve for subdivisions (Chart V).



The two curves will be found totally unlike, as the deflation makes little change in the pronounced movements of the curve of subdivisions, whereas it radically changes the more moderate curve of deeds. Comparison of Charts XI and XII reveals opposite trends. The downward tendency of the ratios in the former and the upward movement in the latter give a basis for the inference that those deeds which represent exchanges between residents are declining in per-capita count, and that those which involve new residents are relatively constant per-capita.

A comparison of the peaks in the two curves is of historical interest, though it will probably not lead to important generalizations. Chart XII does not show such inactivity from 1880 to 1886 as is shown in the curve deflated by gross

population (Chart XI). The number of deeds filed was low, but so was the rate of immigration. Immigration was still low in 1890, and consequently the peak at that date looms up particularly high on Chart XII. For the same reason, the sag which appears on Charts V and XI in 1901 is not so sharp when viewed in the deflated form on Chart XII. In 1906 and immediately following, on the other hand, the rate of immigration was so high that the activity of that date, when divided by the large immigration, is completely canceled out, so that the peak disappears. By 1920, the rate of immigration had subsided, so that the recent peak of 1925 is discernible. The major cycle for the ratio of deeds to estimated population increment (Chart XII) has been from 20 to 30 years in length.

The real estate series have been deflated by gross population and by increment in population. Another possible basis for deflation is the gross number of lots. The latter figure was obtained by a process of sampling and estimating, and is admittedly inaccurate. The tax bills sent out by the County Tax Collector were examined at five-year intervals. At each of these intervals, for each significant area within the County, a sample was taken of a number of pages in the assessment book, and from this sample a count was made of the number of bills and the corresponding number of lots. The resulting proportions were charted and subjected to free-hand smoothing. In the early years, the count of subdivided lots was compared with the estimate from the bills, and the larger of the two numbers was accepted as the better estimate. Obviously, reliance cannot be placed upon the accuracy of results based upon this type of estimate, yet they do give an approximation to the desired figure. Chart XIII presents the

ratio of deeds to the estimated gross count of lots. The only significant differences between it and Chart VII are that in Chart XIII the peak at 1890 is advanced to 1888 or 1889, and Trend III is flattened.

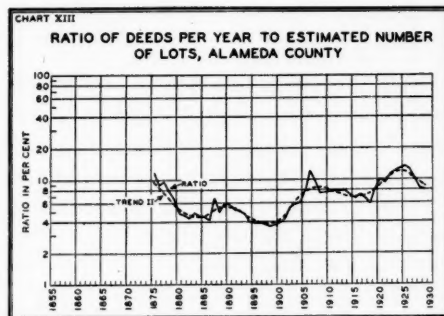


Chart XIV presents for the East Bay Urban Area, a portion of Alameda County which is now entirely incorporated, the relationship of two variables to population. Professor Ernest M. Fisher⁷ has expressed the opinion that the ratio of total lots to population tends in each community to vary about a constant figure. Probably his conclusions apply only if the boundaries of the area considered are allowed to expand as the increasing population calls new territory into urban use. It would appear from Curve B that, for the fixed area here studied, from the boom period of the early 1890's this ratio has continuously decreased; in other words, the population per lot is becoming continuously more dense. In the period stated, the ratio has declined from 1.4 lots per person to .5 per person. In this case, in addition to the logarithmic scale (Curve B on Chart XIV), the figures are presented on an arithmetic scale in Curve C of Chart XIV to facilitate direct comparison with the charts presented by

⁷ Ernest M. Fisher, *Real Estate Subdividing Activity and Population Growth in Nine Urban Areas* (Ann Arbor: Michigan Business Studies, 1928, Vol. I, No. 9.)

Fisher for the cities on which he reported (with the reservation that this study is for a fixed area, whereas Fisher's is for expanding areas).

incorporated territory will be attained.

Conclusion

Forecasting may be undertaken for San Francisco and Alameda County upon the basis of the findings in this article. Preliminary inferences may be based upon the trends and cycles which have been measured. Attention should be given to the probable direction of the secular trend (that of the third order), the probable timing and amplitude of the major movement about the secular trend, and, for the immediate future, the probable timing and amplitude of the minor movement about Trend II. This procedure will give a simple, almost mechanical projection into the future of the curves presenting the history of the phenomena and this projection may be regarded as a first approximation to a forecast. The mechanical forecast should, of course, be modified to reflect the probable effect of all relevant facts. This article has presented the fluctuating activity in subdivision and retail real estate markets, with little discussion of the causes of the movements. Certainly, however, the factors influencing these up and down swings must be isolated and, so far as possible, measured, before real estate forecasting can command any substantial degree of confidence.

Activity in real estate fluctuates decidedly. It feels particularly the long cycle of about 15-years' duration, to which variables of speculative character tend to respond actively. The data presented here show that subdividing activity has this characteristic in high degree. The significant cycles in real estate activity probably have a broader reach than the short-swing movements popularly called "business cycles" and are probably substantially influenced by the factors which produce "new era" booms and acute depressions such as we have recently been experiencing.

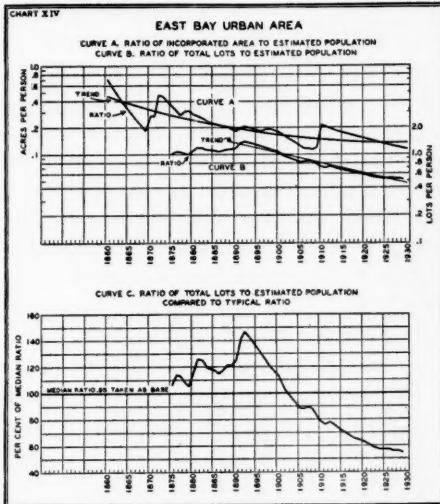


Chart XIV presents in Curve A the ratio of incorporated area to population. An increase in population causes a steady fall in the ratio, until one of the cities annexes territory or a new city is incorporated, suddenly increasing the ratio. This action may be on a large scale, as in 1869 to 1872 and again in 1909. In any event, after the incorporation, population goes on increasing and the ratio resumes its downward direction. The trend shows that in 1860 there was about one-half acre of incorporated territory to each person in the East Bay Urban Area (then, of course, largely rural), and that the figure has decreased to about one-sixth acre per person in 70 years. For further study it would be advisable to select a larger area, including portions of the adjoining county, in order that future incorporations might be observed. It is safe to forecast that in the next 50 years, if the urban area is properly selected, a density of about 10 persons per acre of

Commission Regulation of Public Utility Service in Connecticut¹

By CLYDE OLIN FISHER

THE law creating the Public Utilities Commission of Connecticut² conferred upon the Commission the powers usually given state commissions with reference to regulation of the kind and quality of service rendered by public service corporations. In the present paper no attempt will be made to appraise the regulation that has been exercised over all utilities coming under Commission jurisdiction. Rather, the discussion is limited to the cases involving telephone, water, gas, and electric companies. Such companies, it is felt, are the ones in the regulation of which the public at the present time has a larger stake.

The statute of 1911 made it an obligation of the Commission to inform itself concerning the condition of service offered by the utilities; authorized it to prescribe standards for supplying gas and electricity; instructed it, upon petition of 10 or more patrons, to investigate the kind of service given by a utility and to order the rendering of adequate service; authorized it to hear any petition for service from a prospective customer living in the chartered territory of the utility, and to issue orders appropriate thereto. This last section has given rise to the most interesting and controversial problems involving utility service.

Subsequent statutes added new types of utilities to the jurisdiction of the Commission and, in general, clarified the powers already conferred by the original

law.³ The most important of these, so far as the utilities discussed in this paper are concerned, was the law of 1914,⁴ which authorized the Commission to fix the standard measures for sale of gas and electricity, to establish the initial efficiency of electric lamps furnished by the utility, and to determine the pressure at which gas and the voltage at which electricity should be distributed.

Telephone Companies

The Commission's responsibilities in supervising telephone service have resulted in only slight work on its part. Only two cases need be reviewed to illustrate the policy of the Commission. Both involved the Southern New England Telephone Company.

In 1918 a petition was brought by a telephone subscriber in Norwalk protesting against the classification of customers into zones and the imposition of a mileage charge for service outside the base zone.⁵ Petitioner claimed that as a resident of Norwalk he was entitled to the same service and terms as were given other residents of the City even though they lived in another section. This constituted, he pleaded, an unwarranted discrimination on the part of the telephone company. The discrimination was shown further by the absence of any mileage charge for party-line service outside the base zone. The Commission denied the petition:

³ *Ibid.* 1913, c. 210; 1915, c. 160; 1917, c. 332; 1919, c. 263; 1921, c. 77 c. 202; 1923, c. 33; 1927, c. 203; 1929, c. 20, c. 199, c. 292, c. 248.

⁴ *Ibid.* 1917, c. 332.

⁵ Doc. No. 2757.

¹ This paper is a part of a more extensive study made possible by a grant-in-aid from the Social Science Research Council.

² Conn. Pub. Acts 1911, c. 128.

"The poorer service may be provided by increasing the number of subscribers on the party line, but where the subscriber residing in the secondary zone requires and receives private or single line service he is receiving the same grade of service as if he were located within the primary zone, and the revenue to the company for that particular line is limited to one subscriber. It is, therefore, proper that he should pay an additional rate, based upon mileage from the base rate zone line."

The reasoning of the Commission apparently applied to a mileage charge for party-line service outside the base zone as well as to single-line service, but the Commission did not so hold.

This case assumes large significance because it was appealed to the courts and judicial sanction was given to the Commission's reasoning.⁶ The lower court affirmed the action of the Commission in denying the petition. Thereupon the case was appealed to the Supreme Court of Errors, which found error as to the form of the judgment while concurring in the conclusion reached. In denying the petition the Commission had said:

"As to whether the mileage charge established by the respondent for single line service outside the base-rate zone is reasonable or unreasonable, no facts were submitted upon which the Commission could base an opinion, but in examining mileage charges established by other telephone companies, and telephone rate schedules prescribed by other State commissions the respondent's mileage charge is not unreasonable in comparison."⁷

This, the Supreme Court held, was a decision upon evidence not properly before the Commission, but upon comparison with rates elsewhere:

"We think the determination of the Commission was erroneous, because rendered upon facts not properly in evidence before

it. As the appeal included the error of the Commission in finding the rate reasonable and not discriminatory, the trial court should have sustained the appeal on these grounds, unless it appeared in the evidence submitted to it that the rate was in fact reasonable and not discriminatory."⁸

Hence, the case showed error as to the form of the judgment and it was remanded to the lower court with orders to change the form of the verdict. The logic of this decision is to restrict the latitude of Commission discretion, in that it precludes the possibility of arriving at a decision on the basis of information which the Commission has but which is not introduced in evidence in the specific case. Such a conclusion, if held to consistently, might well be a serious limitation upon adequate Commission regulation in other cases.

Because of the significance of the issues raised, the Court felt impelled to indicate its views as to the validity of a mileage charge in general, although this was not essential to a decision in the case before it. In so doing, it expressed approval of the principle of such a charge, but it went farther than the Commission had gone and stated the reasons for approval of a charge for single-line service, whereas no such charge was made upon party-line service in excess of that placed upon similar service in the base zone.

"The record discloses no element of unfairness in the division of the exchange area into the thickly-settled and the sparsely-settled zone. Nor does it present any element of unfairness in the charge of a larger rate in zone B than zone A. The evidence warranted the findings as recited. The difference in additional charge to individual or single-line subscriber in zone B and the continuance of the same party-line charge in zones A and B, may be justified if the poorer service rendered for the common charge equals

⁶ *Gallagher v. So. New England Tel. Co.*, 99 Conn. 282 (1923).

⁷ *Ibid.*, at 293.

⁸ *Ibid.*

the fair amount the party-line subscriber in zone B should pay over the same kind of subscriber in zone A. In reaching this result proper allowance should be made in fixing the party-line rate in zone B for the general benefit to the Company, and hence to all subscribers in the development of new business, and especially new rural business."⁹

But since no evidence was presented to show that party-line service in zone B was inferior to similar service in zone A, some doubt remains as to whether in the case at bar the plaintiff had just ground for grievance. This point he did not raise nor has it been raised subsequently.

The other telephone case to be examined was brought in 1926 and also involved a charge of discrimination. The petitioner had been a resident of Groton and had enjoyed use of a club-rate telephone service for business purposes. In 1926 the company established Groton in a base-rate area and permitted telephoning within wider limits at no increase in fixed rates. Thereupon the company withdrew the club-rate service for business use and offered a single-line service at \$3.50 per month, a higher charge than the old club rate. Petitioner claimed that the old service was adequate for his limited use and that he should be given the privilege of remaining on the old basis.¹⁰ The Commission denied the petition:

"It appeared from the testimony that the club-line service is no longer being supplied subscribers using a telephone for business purposes, so that granting the request would be a discrimination which the Commission cannot approve. It frequently happens in the classification of service that there are some cases where the classification is not advantageous to a few, although advantageous generally. The limited need of the complainant for a telephone is such an example, but placing him in an individual class and giving him particular service to fit his cir-

cumstances is an illegal classification for customers, and discriminatory."

These two cases leave no room for doubt as to the Commission's general approval of the principle of classification of telephone service into zones and classification of different types of subscribers for purposes of rate-making.

Although indicating a willingness to examine instances of inadequate telephone service upon proper complaint, the Commission has refused to take the initiative in such matters. Probably no warrant for Commission initiative is to be read into the statute. At any rate, the Commission has settled its policy definitely in this respect. Answering a criticism of its failure to institute proceedings on its own motion in 1918, the Commission said:¹¹

"No complaints, formal or informal, have come to the Commission which would warrant such an investigation or justify the necessary expenditure therefor. Utility company patrons are afforded ample opportunity of making complaints and, in the absence of complaints, it may justly be assumed that both rates and service are reasonably satisfactory."

This view indicates that the Commission has adopted a passive or judicial-minded view of its responsibilities in insuring adequate service. There is grave doubt whether the patrons of a company can always be relied upon to institute proceedings where service is inadequate. If this doubt is warranted, the probability of securing adequate regulation becomes remote.

Water Service

The law of 1911 provided that the term "public service company" should not include towns or cities or any municipal corporation or department thereof.¹² Municipally owned water companies,

⁹ *Ibid.* at 289-290.

¹⁰ Doc. No. 4783.

¹¹ Doc. No. 2757.

¹² Pub. Acts 1911, c. 128, §1.

therefore, did not come within the Commission's jurisdiction. In 1916 the Commission recommended that this exception be removed to the extent of conferring upon the Commission jurisdiction over municipally owned utilities operating outside the corporate limits of the municipality where owned.¹³ The Legislature did not act upon this request, but in 1921 it did authorize the Commission to require annual reports on prescribed forms from municipally owned utilities.¹⁴ The policy of the Commission in connection with water service, therefore, will be examined only with reference to the operation of privately owned corporations.

The cases involving service by water companies fall conveniently into four categories: quality of water supplied; extension of service to new customers; the repair and upkeep of service pipes; and meters for water service. These will be examined briefly in order.

Quality of Water. The first significant case arose early in 1913 when the Warden and Burgesses of New Canaan and 56 others complained of the quality of water and the service given by the New Canaan Water Company.¹⁵ Upon hearing the Commission found that the water furnished was "at times, highly colored, turbid, having an offensive odor and taste, and is unpotable and unfit for domestic uses." It therefore ordered the company to

"purify its water drawn from its present reservoir, by filtration, with, if necessary, preliminary treatment by coagulation and aeration or otherwise, as will result in furnishing to its patrons and supplying the town of New Canaan with water free from suspended matter, pathogenic germs, noticeable coloration and unpleasant tastes and odors, on or before July 1, 1913."

¹³ Report Conn. P. U. Com. 1916, p. 14.

¹⁴ Pub. Acts 1921, c. 199.

¹⁵ Doc. No. 402; Report Conn. P. U. Com. 1913, pp. LX-LXII.

Upon an application from the company for an extension of time within which to comply with the order, the Commission on May 15, 1913, said there was no sufficient reason to grant the request; it also noted that the company had already started the ordered changes and had become financially obligated therefor.¹⁶ The Commission did not consider the financial aspects of controlling significance, deciding rather that the obligation to furnish pure water was the paramount duty of the company.

In its annual report for 1914 the Commission repeated the suggestion of an earlier report that the "State should investigate all sources of supply within her borders and possibly inaugurate a policy of control and regulation as will secure forever to each and every community its full and just share of nature's supply of pure water."¹⁷ It listed the various measures taken by the 77 reporting companies to protect watersheds and indicated that six companies had different kinds of filtration systems. The State has not adopted the Commission's recommendations. This suggestion, made shortly after the appointment of the Commission, reveals the concern felt at that time for the future public convenience in this type of public utility. It also suggests public welfare, rather than corporate gain, as the controlling factor in Commission decisions.

This conflict between the company in its financial aspects and the need of the public for an adequate supply of pure water had arisen in the early part of 1913 when 22 patrons of the Cromwell Water Company asked the Commission to require the company to supply an adequate amount of water of good quality.¹⁸ The company contended that

¹⁶ *Ibid.*, p. LXII.

¹⁷ Report Conn. P. U. Com. 1914, p. 8.

¹⁸ Doc. No. 560; Report Conn. P. U. Com. 1913, pp. LXVIII-LXX.

its difficulties were attributable to financial weakness in spite of the fact that the chief stockholder had contributed money personally to keep the plant running. The Commission held that, if efficiently managed, there was no reason why the company could not grant the needed relief. Therefore, it ordered the cleaning of standpipes, repair of broken parts, improvement of the filter system and pumping station, the keeping of an adequate supply of coal on hand, and a constant watch to keep the water free from contamination. Upon failure of the company to make the stipulated changes the attorney-general instituted proceedings in court to compel the company to comply with the order. Before the case came to trial the company was sold to reliable owners who agreed to make the required improvements and the application was withdrawn.¹⁹ No further complaint has come from customers of this company, so it may be that the conditions complained of have been remedied. The case is important primarily as evidence of the policy of the Commission in giving slight weight to the financial condition of the company in contrast to the requirement of adequate service.

A somewhat different issue arose in 1919 in a petition to require the Seymour Water Company to supply adequate service.²⁰ The chief reason for the failure of the company in this respect lay in the diversion of too great a quantity for the operation of hydraulic elevators. The Commission held that "the paramount use of water in any community is for domestic purposes, and its use for power purposes should be so regulated as not to seriously affect the domestic use." Accordingly, the company was ordered to install larger mains and connections and to make other necessary

improvements. Chief interest in this case lies in the expression of a policy favoring the domestic rather than the industrial consumer of water in the event of a conflict between the two. This is entirely consistent with the already indicated concern for the public welfare.

A more complicated issue was presented to the Commission in 1930 in connection with a petition for better service by the Groton Long Point Association. This was an association of summer residents living in a section that had been developed by the Groton Long Point Land Company, owner of the water system. The Commission ordered the company to make temporary improvements for the supply of water in the summer of 1930 and to begin permanent improvements to be ready by the summer of 1931. This, it suggested, should be done in cooperation with the Groton Long Point Association.²¹

In the meantime the Association prepared to issue bonds to provide an adequate water supply; thereupon the representative of the water company wrote to the Commission that this was regarded by the company as a release from any obligations to make further provisions carrying out the order. To this letter the attorney for the Commission replied that the order held until such time as the company was granted relief through formal action by the Commission. In April, 1931 the company, in a letter to the Commission, claimed to have made all improvements possible without undergoing a complete reorganization. Again, on July 10, 1931, a letter indicated that the Association had authorized a committee to purchase the equity of the Land Company, including its water plant and equipment, and that

¹⁹ 8th Biennial Report of Attorney-General of Conn. 1915, pp. 20-21.

²⁰ Doc. No. 2675.

²¹ Doc. No. 5472.

a contract had been made for getting water from the Borough of Groton.²²

While the above cases all indicate a determination to promote the public good in insuring an adequate supply of pure water, no case on record shows the Commission to have taken the initiative in securing this end. The Commission is not given a mandate by the statute to initiate such proceedings and perhaps is not open to criticism on that score. Furthermore, water service in its very nature is something which, if inadequate or unsatisfactory, induces action on the part of consumers. No particular technique is needed to detect poor service in this field and unsatisfactory service is so irritating and menacing to health as to precipitate action by patrons.²³

Extension of Water Service. In passing upon petitions to require the extension of water to would-be patrons living within the chartered territory of the companies, the Commission has had to decide nice points and to weight desirability to the proposed patrons against cost to the companies. In 1914 residents on Beacon Avenue in New Haven requested the Commission to compel the New Haven Water Company to extend water to their homes.²⁴ The Commission denied this request on the grounds that the extension would involve an expenditure of \$7,000 and only two houses would be served; prospective building on the remaining lots was uncertain; and the extension might overburden the company's limited high pressure supply.²⁵

In 1918 the Commission refused a petition to compel the Jewett City Water Company to make an extension of 400 feet to provide for a fire hydrant and to supply three additional houses with water.²⁶ The Town had already extended

a sewer pipe on the street to be served but the water company declined to install a water service at its own expense. The Commission decided the case not upon its merits but on the grounds of the necessity for the conservation of energies and resources during a period of war.

A review of the cases would indicate that the Commission has been much more inclined to insist upon water of good quality and adequate quantity for territory already served than to compel the companies to make extensions to undeveloped territory covered by their charters. The Groton Long Point case also shows a closer follow-up of its decisions by the Commission. In the earlier cases, notably the Cromwell Water Company decision, the Commission seemed to assume that the order would be carried out and, if not, the matter would be brought to its attention by the patrons. In the Groton case, on the other hand, the company to which the order had been issued was called upon at different intervals to make reports of progress. This indicates a change in the administrative efficiency of the Commission in enforcing its orders. Whether this improvement in administrative follow-up has become a settled policy is uncertain, since the number of cases to which it has applied is not yet adequate to warrant generalization.

Service Pipes for Water. The installation and maintenance of service pipes to the curb lines of property served by water companies has come before the Commission in a number of cases. According to the Commission, a practically universal policy among municipally owned water companies has been to finance the installation of service pipes to the customer's property line.²⁷ But

²² Letters filed with Doc. No. 5472.

²³ Cases of service similar to those discussed above are involved in Doc. Nos. 526; 2107; 3980.

²⁴ Doc. No. 1115.

²⁵ The Commission also refused to order extension of water service in Doc. Nos. 1519; 1843; 5373.

²⁶ Doc. No. 2924.

²⁷ Doc. No. 3290.

the practice by private companies has varied as between companies and as between the same companies at different times. While the cases involving this issue have not been numerous, they give a clear picture of what until recently had been the general policy of the Commission.

The leading case on this point was presented in 1918 when a request was made to require the Guilford-Chester Water Company to repair the service pipe and renew service to a customer whose water had been cut off by the company because he had declined to repair the pipe and stop a leak.²⁸ Prior to 1915 the company had installed service pipes to the curb line, but in that year it adopted a policy whereby subsequent patrons would be required to pay the cost of such installation. The pipe in question had been installed by the Company. The Commission held that

"Until such time as there may be an official determination of an equitable, uniform rule, applicable to all companies, pertaining to the laying and maintaining of water service pipes, the Commission is of opinion that the rules of the company in effect at the time the service pipes were first installed, should control, unless such rule be changed by mutual agreement between the company and the consumer."

Consequently, the company was ordered to repair the pipe and to supply the petitioner with water at its regular rates.

The ruling in the above case left an awkward situation because some customers of the water company received gratis what others were required to pay for. In 1920 this discrimination was presented to the Commission with the request that the company take over the cost of installing and maintaining all service pipes to the curb line.²⁹ The Commission concurred in this view,

basing its decision on the former policy of the company and the apparent willingness of the patrons to pay a fair return on the property with wise management.

While this decision seems broad enough to cover other cases in which patrons are charged with the cost of laying and maintaining service pipes, some companies in Connecticut still charge this cost against the consumer. Whether this is a result of consumer inertia or of an ignorance of the nature of the decision noted, does not appear. The record does not reveal that the Commission had been called upon until 1931 to apply its doctrine to other cases that would seem to fall in the same category. A memorandum issued in February, 1932³⁰ indicates that the Commission either has changed its policy or else is unwilling to apply its general rules consistently. The writer, as one of the petitioners in this case, failed to get a ruling to apply to the Portland Water Company. The history of this petition throws light upon Commission procedure and policy.

The Portland Water Company some five years ago, like the Guilford-Chester Water Company, changed its rule and thereafter placed on its customers the responsibility for installing and maintaining service pipes. On August 19, 1931 a formal request was sent to the company for the installation of a new service pipe, and reference was made to the decision in Doc. No. 2714. No answer was received and the request was repeated one month later. The company in reply refused categorically to assume the burden requested. Thereupon copies of the correspondence were sent to the Commission with the request that they apply the ruling of Doc. No. 2714 to the Portland Water Company.

²⁸ Doc. No. 2714.

²⁹ Doc. No. 3290.

³⁰ Doc. No. 5711.

At about this time the Commission moved its offices and apparently the letters in this case were lost. On January 21, 1932 duplicate letters were sent and the request repeated again. In the meantime there was a water famine in Portland caused by the drawing off of water to repair a leak in the dam. On October 30, 1931 a number of patrons, including the writer, petitioned the Commission to require the company to "give adequate service."³¹

At a hearing on November 9, 1931 customers presented their case for "adequate service," requesting among other things that as a part of such service the company assume responsibility for service pipes as had been the case before the change of policy referred to above. Notwithstanding the fact that the Commission admitted testimony on this issue and did not rule it out as irrelevant, in a memorandum of February 27, 1932 the Commission said: "This matter likewise was not formally before the Commission upon the allegation of the petition."³² The petitioners thought this point was formally before the Commission and no suggestion was made at the time that it was not relevant.

On March 3, 1932 the writer again requested the Commission to apply the doctrine of Doc. No. 271⁴ to the Portland Water Company. The secretary to the Commission replied on March 11, that

"the decision in . . . Doc. 271⁴ . . . presented certain features which led the Commission to require that the company continue its former policy . . . If you wish to pursue the question . . . and will present . . . a petition, we will arrange a hearing."

The matter has not been pursued further for the very good reason why customers

frequently fail to register complaints—namely, the money involved is not sufficient to warrant the trouble and expense. The case illustrates not only customer inertia which frequently results in inadequate regulation, but also the disinclination of the Commission to apply to a new situation a general principle enunciated in an earlier case. It also indicates the refusal of the Commission to admit evidence, on purely technical grounds, which was not objected to at the time of the hearing and which petitioners thought in evidence. The most plausible explanation for the change lies in the fact that there has been a change in personnel by the appointment of one new member of the Commission. At present, therefore, the Commission cannot be said to have any policy as to maintenance of service pipes to customers' property lines.

Metered Service for Water. The general views of the Commission as to meters for water service can be found in a decision made in 1919:³³

"This Commission has repeatedly advocated and recommended the use of meters in the distribution of water as being more equitable to both the company and the patrons and particularly efficacious in a proper conservation of the supply."

Many cases, however, are not so simple as that of deciding for or against meters. For example, in 1917³⁴ a petitioner asked that the Jewett City Water Company be compelled to supply water to his two-tenement house through one meter. The company had done this formerly at a cost of \$20 annually to the owner. Then it adopted a rule whereby each tenant must be supplied with a separate meter or else pay a flat rate, in this case \$37. Yet the company continued to advertise metered rates for water. The Commis-

³¹ *Ibid.*

³² *Ibid.*

³³ Doc. No. 3020.

³⁴ Doc. No. 2532.

sion held that the owner had a right to insist upon service at the advertised rate and the use of one meter for his entire enclosure:

"From an economic standpoint, however, a public service company should avoid unnecessary duplication of plant or equipment and other unnecessary expense in supplying its patrons with its particular utility. Where two or more families occupy the same building and the water rent for all families is paid by the owner of such building who desires that the building be supplied for all families through one meter, equally good service can be thus obtained without the original cost of installation and maintenance of additional meters and contributory expense of meter reading, bookkeeping, etc . . ."

The Commission reached a like conclusion in a case decided in 1919.³⁵ In this case the Guilford-Chester Water Company adopted a rule requiring a separate charge for a garage or hose connection even when the water was served through a meter. The Commission decided against this practice:

"If the owner of the property within a common enclosure elects to make a contract for water supply thereto and becomes responsible for the payment therefor, and all the water supplied to such customers within such enclosure, including hose and garage,

is measured through a single meter, one minimum charge only should be introduced; but if it is desired that the water supplied to separate departments or families within such enclosure be measured through different meters, then a minimum charge should apply for each meter."

It should be noted, in passing, that the addition of a charge by water companies for garage or outside faucets when water is sold by meter is comparable, from an economic point of view, to the practice of electric light companies in making an area charge as well as a demand charge in addition to that made for current consumed. At any rate, this is true to the extent to which the area and demand charges of electric service are based upon capacity and consumer costs. The same justification could be made by a water company if required to maintain plant and equipment adequate to the service of an apartment house in contrast with a private residence. This practice of electric companies, arising in numerous cases, has received Commission sanction.

This article will be concluded in the August issue of the *Journal* with a discussion of the Connecticut Commission's regulation of service in the gas and electric utilities.

³⁵ Doc. No. 3020.

II. The Evolution of Steam Railroad Electrification*

By MYLES E. ROBINSON

III. Development of Electrification in the United States

STEAM railroad electrification in the United States had its origin when the Baltimore and Ohio Railroad electrified its Baltimore tunnel to eliminate the menace of operation under smoke hazards. This occurred in 1895. About the same time, the New Haven installed electric traction on a small portion of its Nantasket Beach branch. Both electrifications were experimental and crude when compared with the standards set by modern electric installations. It must be remembered that these two electrifications were completed only a few years after the first commercial application of electricity to railroad transportation. In 1888 F. J. Sprague had introduced the electric trolley system in Richmond, Virginia, and in 1894 the City of Chicago granted the Northwestern Elevated Railway Company a franchise to operate an electric railway.⁷ Thus, as might be expected, early steam railroad electrifications were not looked upon as introducing a new era in motive power for transportation.

Railroad electrification in the United States may be divided into three periods: the first, from the Baltimore tunnel installation to the initiation of electric operation on the Milwaukee in 1915; the second, from 1915 to 1919; and the

third, from 1920 to the present. While the characteristics which help to set off these periods overlap, it is possible to make a general summary if this overlapping is kept in mind (Table IV).

The Period 1895-1915. The two 1895 electrifications were followed within a few years by the installation of electric traction on a portion of the New Haven then characterized by relatively dense passenger traffic. Third-rail collection of D. C. power was employed then, as in practically all electrifications prior to 1907, at which time the Erie used overhead collection of alternating current in its Rochester-Mt. Morris installation. Manson, in his *Railroad Electrification and Electric Locomotive* (p. 127), adds that the latter installation "bears the distinction of being the first case where a single-phase alternating-current system has been placed in commercial operation on a steam railroad."

Up to 1905, electrifications were largely the result of so-called voluntary factors. However, in 1905 the Long Island Railroad was forced by legislation of the City of New York to electrify its tunnels in the terminal area included within the city limits. Considering tunnel electrification alone somewhat less economical than electric installation on an entire division, the Long Island electrified nearly 40 miles of its Flatbush-Rockaway Division.

* The previous installment of this article analyzed the reasons for electrification of steam railroads, and traced its development in Europe from its beginning in 1893 together with a description of the various types of installations in use there. Footnotes and tables in this

article are numbered consecutively with the first installment.

⁷ H. S. Haines, *Efficient Railway Operation* (New York: Macmillan Co., 1919).

In 1906 the New York Central approaches in the New York area. Electrified its tunnel and terminal ap- trification was extended to White Plains,

TABLE IV. STEAM RAILROAD ELECTRIFICATIONS IN THE UNITED STATES,
AS OF JUNE 30, 1930*

Railroad	Mileage Electrified			Date	System Installed	Type of Service	Reasons Assigned for Electrification
	Route	Track	Percentage of Route to Track Miles				
Baltimore and Ohio (Baltimore Tunnel)	3.60	7.96	45.2%	1895	650-D. C. Third-rail	Freight and passenger	Tunnel smoke
Boston and Maine (Hoosac Tunnel)	7.92	21.38	37.0	1911	11,000-A. C. Overhead	Freight and passenger	Increase capacity; eliminate tunnel smoke
Butte, Anaconda and Pac. (Butte-Rocker, Mont.)	37.38	122.75	30.5	1913	2,400-D. C. Overhead	Freight and passenger	Increase capacity; general economy
Chicago, Milwaukee, St. Paul and Pac. (Montana-Idaho-Washington)	658.77	878.47	75.0	1915-27	3,000-D. C. Overhead	Freight and passenger	General economy; heavy grades; tunnels; increase capacity
Delaware, Lackawanna and Western (New Jersey Suburban)	78.70	173.00	45.4	1930	3,000-D. C. Overhead	Suburban	Increase facilities; petition from communities to be served; rates guaranteed
Detroit, Toledo and Ironton (Fordson-Flat Rock, Mich.)	16.58	50.05	33.1	1926	22,000-A. C. Overhead	Freight	City ordinance; increase capacity; smoke elimination
Erie (Rochester-Mt. Morris, N. Y.)	33.76	36.23	93.2	1907	11,000-A. C. Overhead	Freight and passenger	Increase facilities
Great Northern (Cascade Tunnel)	25.50	31.70	80.4	1909-28	11,000-A. C. Overhead	Passenger and freight	Smoke elimination; increase capacity
Illinois Central (Chicago-Richton, Ill.)	37.80	127.10	29.7	1926	1,500-D. C. Overhead	Suburban	City agreement; smoke elimination; increase facilities
Long Island (Long Island)	138.08	424.40	32.5	1905-26	650-D. C. Third-rail	Suburban, passenger and freight	City ordinance; tunnels; cooperation in terminal operation
Michigan Central (Detroit-Windsor, Can.)	4.60	28.55	16.1	1910	650-D. C. Third-rail	Freight and passenger	Smoke in tunnel
New Haven (Mass.-R. I.-New York)	42.73	113.82	37.5	1895-1907	650-D. C. 3R Overhead	Suburban passenger	City ordinance; increase facilities; tunnel smoke
(Conn.-New York)	92.14	545.46	16.9	1908-27	11,000-A. C. Overhead	Passenger and freight	Increase capacity; general economy
New York Central (New York-White Plains)	63.10	326.64	19.3	1906-26	650-D. C. Third-rail	Suburban passenger	Tunnel smoke and safety; increase facilities.
Norfolk and Western (West Virginia)	63.70	209.54	30.4	1915-25	11,000-A. C. Overhead	Heavy freight	Heavy grades; tunnel smoke; increase traffic
Pennsylvania (New York-New Jersey)	88.41	260.46	33.9	1906-10	650-75-D. C. Third-rail	Passenger	City ordinance; terminal improvement; increase capacity
(Philadelphia)	36.16	124.65		1914-18	11,000-A. C. Overhead	Freight and passenger	Increase terminal capacity
Virginian (Mullen-Roanoke)	134.00	231.00		1926	11,000-A. C. Overhead	Heavy freight	Grades; tunnels; heavy freight

*Many of the data presented in the above table have been taken from annual statistical reports on steam railroad electrification published by the American Railway Association, American Electric Railway Association, and National Electric Light Association. In addition, certain information on recent electrification has been furnished by the Westinghouse Electric Company and the General Electric Company.

a few miles from the New York terminal. Shortly after the court order which had forced the New York Central electrification, the Pennsylvania and the New Haven made certain terminal electric installations. The latter engaged in electrification largely because of the necessity of coordinating its operations with those of the New York Central over whose lines it had trackage rights. In the case of both the New Haven and the Pennsylvania third-rail feed was used.

The remaining years of the first period witnessed few initial electrifications; most of the installations made were additions to route mileage already electrified.

The Period 1915-1919. The second period of electrification, including the war years, is chiefly of interest because of the main line installations of the Chicago, Milwaukee, St. Paul and Pacific (then the Chicago, Milwaukee and St. Paul), and the Norfolk and Western.

Before considering these two major projects mention should be made of the New Haven road which in 1914-15 initiated its first A. C., overhead collection in one of its denser traffic areas. If one excepts the Erie's 1907 installation, which was of minor importance as far as traffic was concerned, the New Haven venture can be considered the first major A. C. electrification in the United States. Incidentally, the New Haven project embodied a plan to generate rather than purchase the greater part of the energy used. The decision to install high-voltage, A. C. feed on the New Haven main line was somewhat unexpected. The New York Central was at the time using D. C., third-rail feed as were most of the other United States

electrifications. Mr. W. S. Murray, in charge of the New Haven project, suggests that the so-called "battle of the systems" originated with the Erie's 1907 electrification and received its major stimulus from the 1914 New Haven move.⁸ Without doubt the influence of the latter has been great. The electrification itself was one of the most carefully considered and carefully worked out installations in American railroad history. Approximately 550 track miles were electrified, including 324 miles of main-line track and 226 miles of secondary and other track. It will be pointed out later that the decision of the New Haven has had an important effect on later electrifications, such as those of the Reading, and the Pennsylvania.

The Norfolk and Western Railway installed electric traction service on a large part of its heavy-grade, rough-profile, West Virginia territory between 1915 and 1917. The desire to increase the capacity of its facilities to meet increased coal traffic demands was the prime motivating factor. Power to supply the needs of the 11,000-volt, A. C. system is generated in the railroad's plants.

The major electrification of this second period, however, was that of the Milwaukee. Certain traffic and transportation problems similar in part to those of the Norfolk and Western motivated the Milwaukee to install 3,000-volt, D. C. service on two of its western divisions.⁹ However, in addition to operating problems the Milwaukee was forced to meet rail and to some degree water competition. The decision to use direct current was a little unusual, especially as the New Haven and the Norfolk and Western

⁸ W. S. Murray, *Superpower—Its Genesis and Future* (New York: McGraw-Hill, Inc., 1925). Mr. Murray's chapter on "Railroad Electrification" is one of the best of recent studies of the problem.

⁹ The profile, i. e. topography, of the Milwaukee, while not as continuously rough as that of the Norfolk and Western, is much rougher in certain sections than that of the latter road. In addition, grades are steeper.

had definitely determined upon A. C., high-voltage collection. However, the Milwaukee's problem was solved by the construction of the necessary substations, a certain amount of transmission line—in addition to that of the power companies already available—and the erection of transmission equipment. Power was purchased. The Milwaukee has been criticized rather severely because of its electrification venture, which was entirely voluntary, since the traffic needs of the time could have been handled by steam motive power. Another criticism has been directed at the power contracts made by the Milwaukee with the Montana Power Company. The guarantee of a 60% load factor was part of the criticism. The road's load factor has rarely exceeded 30%.

The Period 1920 to Date. The third period of electrification is significant in that electric installations made in the past six or seven years have been preceded by exceedingly careful study of the economic advantages to be gained, particularly those broader economies relating to territorial development, and a careful weighing of the relative advantages of steam and electric power. To cite an example: the Illinois Central Railroad, in making a study of the advantages to be gained by electrification of the Chicago suburban area served by that road, employed engineers advocating both types of electric traction systems, D. C. low-voltage and A. C. high-voltage, overhead contact. A study was made of the New Haven and New York Central installations and the results applied as far as possible to the Chicago problem.

A desire to build for the future has characterized the last period and the one through which we are now passing. To what extent this is the result of increasing competition of other railroads and

other types of transportation is subject to some question. That it is more than an attempt to meet present operating and traffic problems alone is evident. The Pennsylvania has recently announced that it intends to electrify its Pittsburgh area. It has already started work on the electrification of the Philadelphia-Wilmington main line. It has been frequently rumored that the New York Central is giving some consideration to the possibility and feasibility of electrifying the Harmon to Buffalo section of its eastern territory. At present a large part of this mileage is served by a six-track system. To some extent competition is forcing such consideration. Moreover, the existing trackage is hardly adequate for heavier traffic than is now handled, especially as this portion of the system must carry the movements of the New York Central, Big Four, Michigan Central, and to some extent the Pittsburgh and Lake Erie.

While the third electrification period has included a number of important installations, probably the outstanding of these have been the Chicago suburban electrification of the Illinois Central and the Virginian's mountain freight installation. In addition to these, at least three other electrifications are in various stages of construction. The Delaware, Lackawanna and Western recently completed work on a large section of its New Jersey suburban area. The Reading is engaged in electrifying certain of its suburban territory. One of the most important of the electrifications in progress is that already noted, the Philadelphia-Wilmington section of the Pennsylvania's eastern railroad network. When this is completed the Pennsylvania will have the nation's largest electrification, both from the standpoint of route miles electrified and with respect to track miles of electric traction.

The only major suburban electrification west of the Alleghenies is that of the Illinois Central, already referred to. In 1926 the first electric unit and trailer began operation on some 37 miles of suburban route south of Chicago. Within a few months the electrification was operating smoothly and efficiently. At first no thought was given to the electrification of through passenger or freight service. Two years ago freight service was included¹⁰ and it was expected that within a short time through passenger service would be electrified. At this writing this has not occurred. The Illinois Central project is important in that it represents a degree of cooperation between city and railroad not to be found prior to 1920. In this case the road, for many years at odds with the City of Chicago over lake front improvement, grade crossing elimination, and terminal improvement, was able in 1919 to present a plan of cooperative terminal and suburban improvement to the City. Two years later railroad and City commenced work on the cooperative projects outlined in the plan. The road commenced its survey of existing electrifications and within a few years was able to initiate work on the electrification.

The agitation for compulsory electrification of certain steam railroad mileage in terminal and suburban areas had its origin in the United States in 1905, at which time the New York City problem was presented. To a certain extent the New York experience, in which electrification has been forced on the railroads, has been used as a precedent in attempting to deal with the Chicago problem. As early as 1915 smoke abatement was discussed. At

that time a committee appointed by the Chicago Association of Commerce published a voluminous report in which it included an exhaustive survey of existing steam railroads serving Chicago, the conclusions of the committee being that steam power would be sufficient to meet most traffic and transportation needs of at least the immediate future. The report pointed out that the railroads of Chicago were causing less than 8% of the smoke of the entire city.¹¹

The agitation for compulsory electrification was abated but little by the report of the Chicago Association of Commerce, though the City ceased to bring pressure on the roads to electrify. After the war the question was again brought to the attention of the public as a result of the rapidly increasing suburban and terminal congestion and the unsatisfactory terminal facilities of the City. The Illinois Central, faced with operating problems of its own, decided to electrify its suburban service. The "Lake Front Ordinance," passed in 1919, was a three-party contract between the railroad, the South Park Commission, and the City of Chicago. In accordance with the terms of the ordinance the railroad electrified its suburban service, completing the installation six months ahead of schedule, in June, 1926.¹²

Probably the outstanding freight electrification of the United States is that of the Virginian, completed in 1926. The Virginian electrified about 134 route miles of its total mileage of 443, a little over 30% of its system. Traffic congestion, limited facilities, and the predominance of heavy, eastbound freight were instrumental in bringing about this the installation. Existing facilities were

smoke emitted. Hence, from the standpoint of smoke nuisance, there appears to be little need for electrification at present.

¹² Freight switching service on the Illinois Central is now electrified.

¹⁰ Electric freight operation only applies to the switching of freight.

¹¹ Since 1915 numerous improvements on the steam locomotive have still further reduced the amount of

inadequate. Trackage through the mountainous territory served could not be increased except at a much higher cost than that necessitated by the existing trackage at the time of construction. Following the example set by the only other major freight electrification in the United States, the Norfolk and Western, the Virginian employed high-voltage, alternating current. Largely because power stations were infrequent along the electrified right of way and for the most part unable to handle the somewhat irregular, and at times heavy, load of the railroad, it was decided to generate the energy used. The Virginian and the Norfolk and Western are the only major roads in the United States generating all energy used on their electrified sections.

A summary of the three periods of electrification in this country shows that: (1) from 1895 to 1914 most electric installations were voluntary and largely experimental, most of them being of tunnel, terminal, or suburban service with but one or two relatively unimportant main-line constructions; (2) the second period witnessed two major electrifications but largely as a result of the chaotic financial conditions of the war and its immediate aftermath, no other electric installations of importance; (3) the period from 1920 to the present has seen the installation of numerous well-planned and economically-justified electrifications, most of them voluntary in the sense that they were not the result of governmental coercion.

Extent of Electrification in the United States. Approximately 7/10 of 1% of the steam railroad mileage of the United States is at present electrified. With the exception of the Milwaukee Divisions, the greater part of this is in the East, particularly in the Atlantic seaboard area between Boston and Washington. Table IV shows that eight of the 16

roads having electrified service are in the East. In addition to these, the Virginian and Norfolk and Western installations serve a territory which is more a part of the eastern than of the western trunk-line area. Of the remaining six electrifications, only four are worthy of more than passing interest, the Milwaukee, the Butte, Anaconda and Pacific, the Illinois Central, and the Great Northern. The last is primarily a tunnel installation, and the second relatively insignificant as far as railroad traffic is concerned. The Illinois Central installation, one of the most important in the trans-Allegheny region, is the only mid-western electrification constructed after careful and to a certain degree exhaustive study of existing installations.

Even with the exclusion of the Milwaukee mileage, main-line electrification exceeds that of any other type in the United States. A little over 65% of the total route mileage electrified in this country is in main-line service. Approximately 20% is in suburban service, and the remaining 15% in tunnel electrification. It is, of course, exceedingly difficult to segregate the mileage of steam and electric operation where both are employed jointly; for example, the Illinois Central electrified trackage is jointly used by the South Shore, the trackage being used by both types of traction on the part of the Illinois Central. The completion of the Reading, Pennsylvania, and proposed New York Central projects will materially increase the percentage of main-line electrified route mileage in the United States and slightly increase the degree of suburban electrification.

Standardization of Equipment. The prospect for standardization of electric traction motive power and of transmission and distribution lines seems to be slight. Until very recent years, "the

battle of the systems," begun in 1907, has shown little signs of abatement. Electric equipment companies have developed rapidly their own standardized systems, bidding against each other for the electrification of each project. Thus one of these, the General Electric Company, has specialized in the installation of electric traction systems employing direct current, with either third-rail or overhead collection. Among the important electrifications engineered by this Company have been those of the Milwaukee, Illinois Central, Butte, Anaconda and Pacific, Lackawanna, and the suburban electrifications of the Pennsylvania, New Haven, and the New York Central.¹³ With the growing need of higher powered installations, because of increasing size, weight, and speed of motive power equipment and cars, the old type of third-rail feed was seen to be inadequate. The electric equipment manufacturer then swung over to the advocacy of relatively high, direct-current voltage with overhead collection, rather than high voltage with alternating current similar to the type of system advocated by the Company's chief competitor. Hence, even among those railroads employing direct current, a lack of uniformity of both power and collection has existed. The writer has been informed that the major electric equipment companies are at present modifying somewhat their stands, but even in view of such changes much unnecessary waste has occurred.

While it is true that such factors as substation cost, including original investment, transmission and distribution costs, and track congestion have an important bearing on the type of electrification installed, little justification is apparent for the installation of

different systems of electrification for the same service and often in the same operating area. A recent example comes to mind. The New York Central, New Haven, and Pennsylvania, and to some extent the Long Island, employ direct current in their New York suburban service. The New Haven, however, is using alternating current of high voltage on its main line. The Pennsylvania has installed the same type of feed and power in its Philadelphia service. Interconnection of the New York Central and Pennsylvania is virtually impossible without duplication of motive power units unless steam power is used (motive power units capable of handling either type of current and feed are available at a relatively high price). Neither can the Pennsylvania, which contemplates extending its Philadelphia system to New York, interchange either passenger or freight equipment with the Long Island, which employs a different type of electric traction system. Likewise, the Delaware, Lackawanna and Western, now erecting a 3,000-volt D. C., overhead feed for its suburban service, will find it difficult to interchange with the Pennsylvania in case the former decides to increase its electrified service to include main-line traffic.

Aside from the difficulties of interconnection and interchange of traffic, the economic waste of having two different systems with numerous variations and combinations in each is not easily condoned. Such costs are, of course, indirectly effective in maintaining, if not actually increasing, the level of rates, which is but one evil attending unjustified equipment expenditure. Electrical engineers, many of them in charge of past or of present electric installations, admit that there is little or no

¹³ The three suburban electrifications employ both alternating and direct current; i. e., the roads named

have electrified two or more divisions of their systems, using different power and collection systems.

justification for the different systems of electrification in the United States. Perhaps this lack of standardization is felt most keenly in the case of electric motive power. At present more than 75 different types of electric locomotives are on the market, whereas the varieties of steam motive power units are less than $\frac{1}{3}$ this number. With the initial investment in electric locomotives from two to three and a half times that of steam units, it can readily be seen that this cost is one of the chief barriers to electrification. In addition, the equipment companies are constantly developing new types of electric locomotives to meet the ever changing systems of installation.

Generated v. Purchased Current. Quite as difficult to locate and evaluate as were the reasons for electrifications are the choices of the separate roads be-

tween generated and purchased current for their electrified lines. Here again local conditions weigh heavily in the decision. Table V suggests the prevailing reasons, although the presence and effect of other factors should be borne in mind.

Table V also indicates that, where the load for the electrification is small, purchase rather than generation of power is the more economical plan. Again, where the load is uneven and is capable of being met with existing central station facilities, purchase of power may be expected. There are exceptions to these observations. For example, the Virginian has what is probably the most uneven load of all steam railroad electrifications, daily increasing from nearly zero at 6 p. m. to 40,000 kilowatts some 40 minutes later. However, the Virginian was faced with the

TABLE V. POWER SUPPLY DATA OF STEAM RAILROAD ELECTRIFICATIONS IN THE UNITED STATES AS OF DECEMBER, 1930*

Road	Source	Power Companies Selling Energy	Reasons for Generation or Purchase
Baltimore & Ohio.....	Pchsd.	Consolidated Gas	Load too small
Boston & Maine.....	Pchsd.	New England Power	Load too small
Chicago, Milwaukee & St. Paul...	Pchsd.	Montana Power	Cheap hydro
	Pchsd.	Washington Water Power	Small load
	Pchsd.	Puget Sound, R., El., Lt. & Power	Small load
Delaware, Lackawanna & Western.....	Pchsd.	Public Service Co.	Irregular load
Erie.....	Pchsd.	Niagara, Lockport & Ontario Power	Small load
Grand Trunk.....	Pchsd.	Detroit Edison	Small load
Great Northern.....	Gen.	Own plants	Cheap hydro
	Pchsd.	.....	Small load
Illinois Central.....	Pchsd.	Commonwealth Edison	Large, uneven load
Long Island.....	Pchsd.	Pennsylvania R. R.	Uneven load
		Long Island Power	Uneven load
Michigan Central.....	Pchsd.	Detroit Edison	Small load
New York Central.....	Gen.	Own plants	Large load†
New Haven.....	Gen.	Own plants	Cheap hydro
	Pchsd.	New York Central	Cheap steam
Norfolk and Western.....	Gen.	Own plants	Low fuel costs
Reading.....	Pchsd.	.....	Irregular load
Pennsylvania.....	Gen.	Own plants	Large load
	Pchsd.	Philadelphia Electric	Steady load
Virginian.....	Gen.	Own plants	Low fuel costs

*A. J. Manson, *op. cit.*, p. 316.

†Sells a small amount of power to the New Haven for suburban service in the New York City area.

problem of obtaining sufficient energy and power to meet its demands with only small stations from which to draw. In other words, the power companies serving the mountainous territory traversed by the Virginian's line could hardly be expected to meet the load necessitated by the freight traffic. The road was thus forced to consider seriously the problem of generation. Low fuel costs enable the road to minimize its generation costs.

Of the six roads generating all or part of the energy necessary for their electrified service, three are serving suburban and terminal service, two are mountain freight electrifications, and the last is generating the energy used in an electrified tunnel operation. Two of the three suburban-terminal electrifications have large loads, somewhat more uniform than other similar services, as main-line traffic uses the energy of the electrified portion of the line.

The majority of the recent electric installations have employed central station power. However, despite the fact that these furnish large and, to a certain extent, fairly regular loads, purchase rather than generation of energy has been decided upon. It is still too early to conclude that the railroads have determined upon a policy of purchasing rather than generating energy and power requirements for their electrifications from central stations. Probably the greater number of suburban electrifications of the future will purchase their power. Strategic location of central stations and substations will, of course, have an important bearing on this point.

Summary

It is impossible in a paper of this length to go into the various phases of all important electrifications of the

United States. The following paragraphs give a bird's-eye view of steam railroad electrifications of the present and a few comments as to certain possible trends of the future. These comments are intended to be prophetic only to the extent that they are based on observations of past and present electrification procedure.

1. Tunnel and Terminal Service. The number of unelectrified tunnels of more than five miles in length in terminal areas will be few in the near future. Most of the tunnels of the eastern seaboard, especially where four or more tracks are utilized, are at present electrified. Of course, unless traffic is of sufficient volume to warrant the added capital cost of electrification, the tunnel installation is less likely to be voluntary and more likely to result from city ordinance. With the rapid growth of terminal electrifications, as in the New York City area, all tunnels included in the electrified area may be expected to be electrically operated. Traffic congestion and legislation will go far in bringing about these installations. The desire of the carriers to stimulate traffic by improved service is an important factor which must not be neglected. With the rapidly increasing congestion of population in the industrial areas of the country a material decrease cannot be expected in traffic congestion.

2. Suburban Service. Agitation for suburban electrification of certain metropolitan areas has been increasing rapidly. The entire terminal and suburban problem of Chicago has been gone into thoroughly by the railroads and by civic bodies interested in terminal improvements. The Association of Commerce report of 1915, concluding that electrification of the metropolitan area of Chicago was unnecessary and too expensive at that time, postponed this

agitation very effectively until the post-war period. In 1923 and again in 1926 the railroads were brought into conflict with the City on electrification measures. In both cases the roads presented evidence of the high costs involved and the relatively small traffic increase which might be expected from such a move. At present the World's Fair year of 1933 may find the City with inadequate terminal and suburban facilities. To a certain extent, terminal consolidation may effect the desired improvement. However, as consolidation of facilities and the necessary relocation of trackage involved therein are a costly process, electrification of existing facilities appears more likely to be adopted by the railroads. In view of the failure of New York to force electrification of its terminal areas it is doubtful whether Chicago will be successful in a similar venture.

Although prices of electric traction equipment may be expected to fall in line with general, lower price trends, present conditions in both the traffic field and the money market make it improbable that the roads could meet the cost of electrification.¹⁴ Terminal electric traction installation alone will hardly pay. Eventually, tunnel, terminal, and suburban installation will take place. Suburban electrification will not

necessarily develop interchange complications. However, terminal electrification, especially where belt-line operation is involved, will call for a certain degree of standardization of equipment. The trend of recent suburban and terminal installations is away from the low-voltage, third-rail feed, D. C. type and toward the relatively high-voltage, overhead collection of direct current.

3. *Main-line Electrification.* Gradual extension of suburban and terminal electrification to include portions of the main line seems to be the process of evolution of railroad electrification. Obviously, some attempt will be made to see that the type of system installed will be the same as that on the other electrified mileage. Aside from an occasional freight or main-line installation in rough-profile territory, probably electric traction will not make much headway in the West or Midwest, at least in the near future. The Sante Fe Railroad made a careful study of the possibilities of electrifying a section of its heavy-grade territory. The decision was that revenues added to the total would hardly meet the increased cost of the investment. Steam power will be able to meet operating conditions in three-fourths of the United States for many years to come.¹⁵

salt," it is true that suburban traffic is in many cases unable to bear its share of operating expenses.

¹⁴One road, the Chicago and Northwestern, has estimated that the interest charges alone on complete suburban electrification would be more than the total present revenue from suburban traffic. While this statement should be taken with the proverbial "grain of

¹⁵Gasoline-electric motive power may be expected to supplant steam service where there are fewer than two or three movements of traffic each way per day.

Book Reviews

Sharfman, I. L. *THE INTERSTATE COMMERCE COMMISSION. Part II. New York: The Commonwealth Fund, 1931. pp. xiv, 533. \$4.50.*

This is the second of a series of four volumes devoted to a study of the Interstate Commerce Commission. This volume deals with the scope of the Commission's jurisdiction, following a book upon the legislative basis of the Commission's authority. Two other volumes in preparation will deal with the character of the Commission's activity and the Commission's organization and procedure.

In the first section of this second volume Professor Sharfman considers each of the kinds of utilities—railroads, water carriers, express companies, transmission companies, etc.—over which the Commission has been given authority and discusses with discriminating judgment the relation of these ancillary jurisdictions to the Commission's main regulatory task. The second part of the volume deals with the kinds of commerce, interstate and intrastate, subject to the Commission's control, as a reflection of the scope of that tribunal's jurisdiction. After an excellent discussion of the distribution of power over commerce effected by the Federal Constitution and the influence of congressional enactments upon that distribution, Professor Sharfman analyzes the character of the Commission's performance in dealing with the difficult adjustments arising from the application of the constitutional principles of local autonomy in the regulation of the national industry.

A final section of this volume, entitled "The Exercise of Administrative Discretion," is in our judgment the finest analysis which has yet been made of the administrative process as applied to American institutions. Its excellence is attributable primarily to the fact that it grows out of a thorough-going and intelligent comprehension of the actual workings of this great administrative tribunal. Professor Sharfman brought to his task a mind trained in both economics and law. He has saturated himself in the facts concerning the workings of this tribunal. With this background

of legal and economic training and a comprehensive knowledge of how this foremost administrative tribunal actually operates, he has produced a realistic and sophisticated analysis and criticism of the administrative process. Instead of beginning with abstract legal principles he has begun with a mature understanding of how this body operates, and from that he has derived conclusions which should be read and absorbed by every administrative officer and by every lawyer and judge who is concerned with the increasingly perplexing problems centering around the exercise of such jurisdiction.

DAVID E. LILIENTHAL

Nash, L. R. *ECONOMICS OF PUBLIC UTILITIES. New York: McGraw Hill Book Co., Inc., 1931. 2nd. ed. pp. xvii, 508. \$4.00.*

The present edition of Mr. Nash's book is somewhat larger than the first one, published in 1925. It contains an added chapter on the public utility holding company; brief treatment is accorded certain new developments, such as interstate commerce in public utility services, the natural gas industry, and the disclosures of the Federal Trade Commission investigation. With these exceptions, there is little change from the first edition in organization, content, or basic ideas.

The events of the last six years and the flood of criticism that has accompanied them appear to have had a slight moderating effect upon Mr. Nash's views. He concedes now that overcapitalization may have undesirable consequences, that some public control of interstate commerce in public utility services is perhaps necessary, that the public utility holding company may require some degree of regulation, that the state system of regulation is not perfect, and that some mistakes of judgment may have been made in the public relations activities of private utilities. On the whole, however, he concedes only a minimum to the critics of public utilities. He is constantly alert to avoid, explain away, or minimize the force of their criticism. Mr. Nash is still, as in 1925, the valiant partisan of private interests, covert-

ly hostile to strict public regulation, and the sworn enemy of all forms of public ownership.

Mr. Nash can perhaps be forgiven a certain bias on controversial questions by reason of his long association with private utility interests. It is not easy, however, for the fair-minded student of public utility problems to be patient with the methods by which he arrives at his conclusions. For sheer perversion of every tenet of scientific scholarship his chapter on public ownership takes the prize. In this chapter can be found illogical and irrelevant comparisons, false assumptions, prejudiced opinion, masquerading as impartial observation, omission of pertinent data, appeals to prejudice, false inferences, and other species of sophistry known to the professional obscurer of truth. Almost as bad are his attempts to explain away the mountain of incriminating evidence in the 26 volumes of the Federal Trade Commission reports, his avoidance of the facts and conclusions derived from public investigations in New York, Massachusetts, Pennsylvania, and by Committees of Congress, his failure to consider adequately the great body of critical literature that has developed within the last six years, and his almost exclusive reliance upon partisan sources for much of his material on controversial questions. Because of these glaring defects of method Mr. Nash's book must be classified with the literature of private advocacy rather than with the scientific material on public utilities.

Bad as it is from the scientific point of view, the book, nevertheless, may well prove useful to those who are prepared to use it wisely and critically. It contains some factual and historical material that is valuable for reference purposes. Certain of the theoretical discussions are stimulating even if one does not see eye to eye with the author. So far as statistical material and court and commission opinion are concerned the book is well up to date. In respect to the proportionate arrangement of material, Mr. Nash has devoted too much space to the mechanics of regulation and to controversial questions and too little space to the thing he is best prepared to do, namely, the actual operation and management of the public utility industries. In this respect he runs true to form with other public utility executives; they rarely speak or write of the intimate details of private management, but deal profusely

with such questions as how to run the government and what is a proper public policy toward the public utility industries. If Mr. Nash out of his long experience had written a simple, straightforward account of how these industries are organized, financed, and managed, it might well have been a permanent and invaluable part of the literature. As it now stands the book will live only as an example of apologetics for private ownership under the existing system of regulation.

HORACE M. GRAY

Metzenbaum, James. *THE LAW OF ZONING*. New York: Baker, Voorhis and Company, 1930. pp. xiv, 569. \$7.50.

This is the first comprehensive book on the law of zoning since Mr. Frank B. Williams' pioneer book 10 years ago, before zoning hit its stride. It is intended not only for the lawyer, but for the many laymen who in nearly a thousand communities find themselves involved in zoning administration, either as members of city councils, zoning commissions, or zoning boards of appeals. I have seen groups of conscientious citizens suddenly catapulted onto such boards, without any guide to procedure or introduction to the scope of their powers and duties, with nothing but a sincere desire to serve their town; and I know that there is a real need for such a book as Mr. Metzenbaum has tried to write. I do not feel that the present volume has altogether met that need.

It is a distinct service to have printed in one volume the Standard Zoning Enabling Act, the New York, Chicago, Cleveland and Euclid, Ohio, ordinances, the rules of procedure and forms of several boards of appeals. All the ordinances given, however, are of the older type providing triplicate, overlapping use, height and area districting, in what Mr. Justice Sutherland has characterized as "tedious and minute detail." Many smaller communities would be better served by the newer and more comprehensible ordinance, providing simply six or seven general classes of districts, with use, height, and area defined for each.

But it is Mr. Metzenbaum's treatment of the legal principles of zoning which chiefly troubles me. It must have been the police power cases that made John Chipman Gray, our greatest authority on real property law, give up teaching constitutional law after one try, with the exclamation that this was not

law but politics. And zoning is the simon pure flower of police power—that balancing of social interest and individual freedom which has a continually shifting point of equilibrium, the resultant of forces not comprised in any vade mecum of constitutional “principles.” This is the province where that may legally be done which has sufficiently often been done; where the validation by the courts of a first step immediately emboldens the forward looking to essay a second step; where the novel, first frowned on by the courts, becomes acceptable with wont, resulting in legal distinctions that are no distinction.

This is a difficult field to chart for the layman, who will accuse a humble or realistic lawyer of trifling with him. But it is truly of no help to recite constitutional principles, the phrases in which the judges cloak their conclusions reached on other grounds. Mr. Metzzenbaum, for instance, wrestles manfully with *Eubank v. Richmond*, and *Gorieb v. Fox*, and the *Cusack* case, only to have to confess that “it is virtually impossible to lay down any ‘General Rule.’”

What the lawyer and city planner together must produce is a book which does not tell a board of appeals that it may attach reasonable conditions to permits for variances; but which tells them what kinds of conditions boards have in practice imposed, what have been sustained by the courts, and what by analogy it may prudently be expected will be sustained. To use a book like the one under consideration is too much like consulting the Vergilian lots.

CHARLES S. ASCHER.

Pomfret, John E. *THE STRUGGLE FOR LAND IN IRELAND*. Princeton: Princeton University Press, 1930. pp. xii, 324. \$3.

So far as Ireland is concerned, said John Stuart Mill in 1847, “the greatest ‘burthen on land’ is the landlords. Returning nothing to the soil, they consume its whole produce, minus the potatoes strictly necessary to keep the inhabitants from dying of famine; and when they have any purpose of improvement, the preparatory step usually consists in not leaving even this pittance, but turning out the people to beggary if not to starvation. When landed property has placed itself on this footing it ceases to be defensible, and the time has come for making some new

arrangement of the matter.” The major part of *The Struggle for Land in Ireland* deals with the “new arrangements” introduced after the Great Famine had driven a large proportion of the Irish population to abandon their native soil. Before Mill’s death in 1873, Ireland was on the way to becoming a nation of peasant proprietors. True, the Act of 1870 contained only a few minor clauses enabling the Irish peasants to purchase their holdings. Its main object was to secure the “three F’s”: fixity of tenure, fair rents and free sale of tenant rights. In this way a system of “Dual Ownership” was set up.

The new system proved unsatisfactory to tenants and landlords alike. But it was an improvement over the measures of the preceding years, which had merely substituted a system of free contract for a system of customary rights. If the terms of the contract were not fulfilled, the peasant forfeited all legal claim to his holding. Furthermore, any improvement the tenant might make benefited the landlord, not the tenant; for after labor and capital had been expended by the peasant, he could be summarily ejected when his lease expired. Such were conditions in Ireland at the time Mill wrote.

The system of “Dual Ownership” was prolonged by the Act of 1881, although land purchase was made less difficult for the peasant. Not until 1896 was it made possible for the Irish peasants to buy out the landlords on easy terms. They availed themselves of the opportunity with alacrity. When the Free State Treaty was proclaimed in 1922, Ireland had already been converted into a land of peasant proprietors.

One would like to think that Mill’s attack on rack-renting had been a powerful factor in bringing about the “new arrangement.” In reality, however, the Irish Land League did more to persuade the English Government than anything Mill ever wrote. By 1880, the peasant revolt in Ireland had grown to such proportions as to lead to the belief, in some quarters at least, that a general massacre of all landlords and agents not under police protection was a conceivable and possible event. The Act of 1881, which inserted the thin end of the wedge destined to lift the “burthen” from the Irish land, was passed under these circumstances.

All this is described in great detail in *The Struggle for Land in Ireland*. The treatise is

a scholarly piece of work. But Dr. Pomfret has written a dull book on a fascinating subject. Like many other doctors' dissertations, *The Struggle for Land in Ireland* tends to "exhaust" both the subject and the patience of the reader. The work is dull, not because it is badly written, for Dr. Pomfret says clearly and well what he has to say, but because the author expresses no opinion on any aspect of his subject. Perhaps the author conceives "pure description" to be the proper aim of a scientific historian. But, as the late Professor A. A. Young has well said, "Science may perhaps be unbiased. But science can never be concerned with 'pure description' for the reason that description is never 'pure.' Scientific as well as aesthetic description requires selection and valuation. Even bias, I suspect, is not without its uses, if only as an energizer, a catalytic agent." *The Struggle for Land in Ireland* comes as near to being "pure description" as is humanly possible. It represents little more than a series of documents which would have been much more comprehensible if arranged in strictly chronological order. Dr. Pomfret's contribution consists mainly in paraphrasing those documents not verbally quoted. Digging out the facts from this mass of semi-raw material is a somewhat wearisome task. The material is there but the craftsman's hand is absent.

It would perhaps be unfair to compare *The Struggle for Land in Ireland* with the work of such seasoned historians as Henri Pirenne and George Unwin, although some of Unwin's most interesting historical studies took shape while he was still a student at Oxford. The most essential difference between the sample of economic history offered by Dr. Pomfret in this volume and the kind of historical study published by a Pirenne or an Unwin lies in the *approach to the subject*. When we read Pirenne or Unwin we know what they think about their subject. When we read *The Struggle for Land in Ireland* we are confronted, for the most part, with documents which are more interesting to read in their original setting. Presumably Dr. Pomfret has ideas, and it is to be hoped that, when his next book appears, we may learn not only what others have thought about the subject he treats, but also something about the author's own conclusions. Unhappily, the one conclusion to be found in *The Struggle for Land in Ireland* relates to

the future, rather than the past. From "pure description" to prophecy is a bold leap, and one taken in the dark. For the wisest among us can know very little about what is *going* to happen. In 1923, when Ireland had become a land of peasant proprietors after the Free State had passed a "sweeping agrarian law" compelling landlords to sell their estates and peasants to purchase their holdings, "the solution of the most difficult problem perhaps in Irish history was finally achieved" (p. 313). We piously trust that Dr. Pomfret's prophecy will be fulfilled.

GRACE M. JAFFE

Jones, Eliot, and Bigham, Truman C. *PRINCIPLES OF PUBLIC UTILITIES*. New York: Macmillan Company, 1931. pp. xiv, 799. \$4.25.

The authors of this book deal primarily with the economics of electric, gas, street railway, telephone, and water utilities but make necessary excursions into "the allied fields of law, engineering, political science and accounting" (preface).

The book begins with an "historical survey" and a chapter on "the characteristics of public utilities" and concludes with a discussion of public ownership. Between these limits are chapters which treat of various methods, agencies, and problems of regulation: franchises; commissions, local, state, and federal; valuation and rate questions; the control of service, accounts and reports, and security issues. There are also timely chapters on "the combination movement" and "public relations."

The work is written, as the authors claim (preface), "in a scientific spirit"; it is systematic, reasonably comprehensive, clear and concise; and its documentation indicates an impartial, energetic, and thorough-going search both for established fact and significant opinion.

In evaluating evidence and argument on controversial questions Professors Jones and Bigham show patience, tolerance, and discriminatory judgment of a high order. Space, however, permits only brief statements of some of the more important conclusions at which they arrive.

The indeterminate permit they consider "the most satisfactory form of franchise yet devised" (p. 119). The service-at-cost

franchise "does not offer a promising solution of the public utility problem" (page 155).

In rate-making the concept "rate-base" should be substituted, in the interest of clear thinking, for "fair value." The initial rate-base should be determined fundamentally by unimpaired investment or prudent investment. Even the United States Supreme Court might accept this view as within the "range of legislative discretion," if it were positively asserted in state and federal legislation.

The rate of return allowed must include compensation for certain inescapable risks. Notwithstanding United States Supreme Court decisions which seem to require that the fairness of the return be determined for each year separately, the utilities should be permitted to set up dividend reserves from the surplus earnings of good years to meet the deficits of poor years.

The rate of return should also include a reward for unusual efficiency and economy; this should perhaps be shared by the owners with the management. The rate should be adjusted to variations in the interest and dividend requirements of individual utilities and possibly to variations in the prices at which common stocks are purchased.

Depreciation should be treated from the point of view of cost and as a loss of service life, not of service value. It should be met by periodic charges to operating expenses

rather than by the method of retirement accounting.

Notwithstanding some disadvantages, "public utility combinations are in the public interest" (p. 609). The authority of the state commissions over combinations, whether of the consolidation or holding company type, should be "widely extended" and the Federal Government should assume control over "holding companies with operating subsidiaries in several states" (pp. 617-618).

The agencies of utility regulation must include state commissions but these may well be supplemented by local commissions in cities willing and able to support them. State commissions should have no authority over the service, rates or security issues of municipally owned utilities, but, in the interest of comparable data, should control their accounts and records. Some federal regulation is required as to subjects over which Congress has exclusive power. This should not be intrusted to the already overburdened Interstate Commerce Commission but to a new commission which should absorb the Federal Power Commission.

Professors Jones and Bigham consider regulation as still experimental and in some respects unsuccessful and public ownership and operation as an expedient the wisdom of which depends upon the facts of individual cases.

WILLIAM M. DUFFUS

Book Notices

Levin, Jack. *POWER ETHICS*. New York: Alfred A. Knopf, 1931. pp. xvi, 191. \$2.

Gruening, Ernest. *THE PUBLIC PAYS*. New York: Vanguard Press, 1931. pp. ix, 273. \$2.50.

Both these books are summaries of the methods and objectives of the propaganda activities of the public utility companies as disclosed by the investigation of the Federal Trade Commission. The first 20 volumes of the reports of the Commission are concerned exclusively with propaganda, as are also parts of the next six. The authors have therefore made available to the general reader the concentrated essence of some 11,000 pages of what would otherwise be almost inaccessible material.

Both books marshal the evidence to show "that the clear object of the propaganda has been to create a public opinion so favorable to the present ownership, management and methods of the industry as to make any real public regulation or change in the industry impossible." This propaganda has been circulated "through pulpit, press, school and college, radio and screen, women's clubs, service clubs and fraternal organizations. To 'pin the Bolshevik label' on those who fought for the public's interest as they saw it, was one of the simplest of the devices in the utilities' far-flung campaign; others included devious attacks on honest textbooks used in the public schools and colleges, the subsidizing of university professors, the control of newspapers, the dissemination of misleading and sometimes inaccurate data."

In the matter of textbooks, for example, such statements as the following have been singled out as objectionable by public utility information bureaus. "Back of the boodle alderman one always finds the respectable banker or eminent financier"; and "gradually cities came to realize that franchises have a monetary value, and that they should be granted only under conditions which will safeguard the interests of the public."

Every effort was made to suppress any admission that municipal ownership is ever successful, but in the correspondence files of the public utility information bureaus the Commission found such letters as the following from the director of a bureau to an important utility house. "The less said about Holland (municipal plant) the better, I have looked into that thing time and time again, and so have others. There are no 'bugs' in it. It is a successful municipally owned plant, and there is no use denying the fact." And again another director comments on a newspaper account of a conspicuously successful municipal plant: "The sad part of that story is that it is true."

While alike in scope and purpose, the two books differ somewhat in method of presentation. There are fewer direct quotations from the testimony and documents in Mr. Levin's book, but almost every paragraph is buttressed by a specific reference to the volume and page of the Federal Trade Commission Report on which it is based. Mr. Gruening, on the other hand, makes freer use of direct quotations from the evidence, but, though the author or publication is mentioned, there are no references to the particular spot in the Federal Trade Commission Report where the context can be found. Mr. Levin's book might almost be characterized as a very readable, topical index to the Report, did not the word "index" connote something dry and uninteresting, which this book is not. Mr. Gruening has focused to a greater extent on the more dramatic high spots of the investigation.

Whether the managements of the utility companies were simply protecting the huge capital actually invested in the industry by the holders of its stocks and bonds or whether their main objective was to protect its dividends on watered stock and other forms of graft, is a question the answer to which will be influenced by the reader's own point of view. That the methods ac-

tually employed by the companies have been worse than dubious from the ethical standpoint is amply proved by the evidence submitted. For its diet of propaganda, "the public pays" and the price is high.

CHARLES H. PORTER

Nichols, Ellsworth. PUBLIC UTILITY SERVICE AND DISCRIMINATION. Washington, D. C.: Public Utility Reports, Inc., 1928. pp. clii, 1087. \$10.

The purpose of this book is to present the rulings of commissions and the pronouncements of the courts on regulatory problems involved in the relations of utilities with their customers. These problems consist in the main in furnishing service and avoiding discrimination and the utilities, for the most part, operate under the guidance of principles enunciated by the administrative commissions. Hence, the book consists principally of carefully selected citations from decisions of various commissions.

Practically the entire utility field is covered, including electric, gas, water, telephone, telegraph, railroad, street railway, and motor bus companies. No attempt is made by the author to analyze, discuss, or criticize any of the decisions presented. In selecting the citations the author has chosen cases to present all the different interpretations by the commissions rather than any one or predominating opinion. The book is most useful as a reference volume in the field of regulatory decisions on managerial problems. This usefulness is considerably enhanced by a detailed and complete subject index, a full table of contents with all subject headings, and a complete, alphabetically arranged table of cases.

While the book is not formally divided into parts, the chapters fall into four main groups: (1) powers and jurisdiction of commissions over service; (2) general service problems; (3) service problems peculiar to particular utilities; (4) discrimination in rates and service.

An encyclopedic reference book rapidly gets out of date, for commissions and courts, fortunately, are privileged to change their views as economic conditions and problems change. This rapid rate of obsolescence might have been retarded if the author had emphasized the more slowly changing principles and attitudes toward public utility service problems.

H. ZINDER